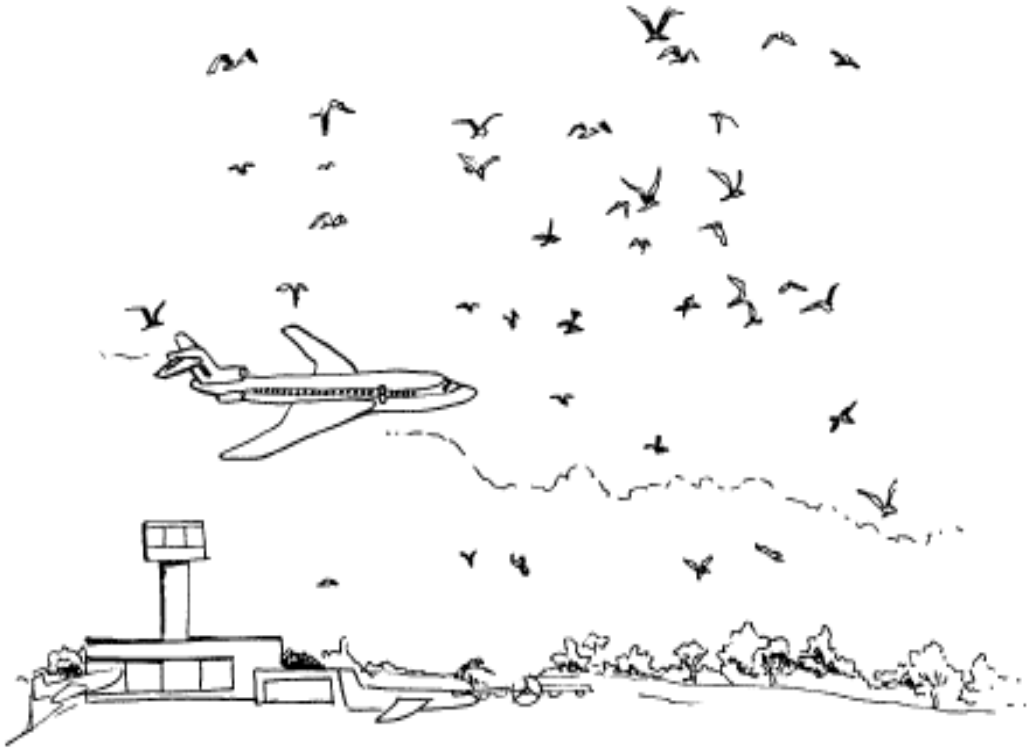
ENVIRONMENTAL ASSESSMENT

REDUCING BIRD DAMAGE

IN IOWA USING

INTEGRATED BIRD DAMAGE MANAGEMENT



ENVIRONMENTAL ASSESSMENT

BIRD DAMAGE MANAGEMENT IN THE IOWA WILDLIFE SERVICES PROGRAM

Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)
ANIMAL AND PLANT HEALTH INSPECTION SERVICE (APHIS)
WILDLIFE SERVICES (WS)

In Cooperation With:

UNITED STATES DEPARTMENT OF THE INTERIOR
UNITED STATES FISH AND WILDLIFE SERVICE (USFWS)

FEDERAL AVIATION ADMINISTRATION (FAA)

IOWA DEPARTMENT OF NATURAL RESOURCES (IDNR)

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP (IDALS)

IOWA DEPARTMENT OF PUBLIC HEALTH (IDPH)

IOWA DEPARTMENT OF TRANSPORTATION OFFICE OF AVIATION (IDOT)

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Acronyms Used in the EA

AC	Alpha Chloralose
AI	Avian Influenza
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BA	Biological Assessment
BBS	Breeding Bird Survey
BGEPA	Bald and Golden Eagle Protection Act
BO	Biological Opinion
CDC	Centers for Disease Control and Prevention
CDFG	California Department of Fish and Game
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CI	Code of Iowa
DOJ	Department of Justice
DP	Depredation Permit
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FY	Fiscal Year
HPAI	Highly Pathogenic Avian Influenza
IWDM	Integrated Wildlife Damage Management
IAC	Iowa Administrative Code
INAD	Investigative New Animal Drug
IDALS	Iowa Department of Agriculture and Land Stewardship
IDNR	Iowa Department of Natural Resources
IDPH	Iowa Department of Public Health
IDOT	Iowa Department of Transportation Office of Aviation
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
MMWR	Morbidity and Mortality Weekly Report
MOU	Memorandum or Memoranda of Understanding
NEDS	National Early Detection System
NEPA	National Environmental Policy Act
NHPA	National Historical Preservation Act
NOA	Notice of Availability
NWHC	National Wildlife Health Center
NWRC	National Wildlife Research Center
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
T/E	Threatened and Endangered Species
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WS	Wildlife Services
WNV	West Nile Virus

SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS); U.S. Fish and Wildlife Service (USFWS); Federal Aviation Administration (FAA); Iowa Department of Natural Resources (IDNR); Iowa Department of Agriculture and Land Stewardship (IDALS), and Iowa Department of Health (IDPH) Iowa Department of Transportation Office of Aviation (IDOT) propose to continue the current bird damage management program in Iowa. WS, USFWS, FAA, IDNR, IDALS and IDPH use an adaptive integrated wildlife damage management (IWDM) approach to protect human health and safety, and reduce bird damage to agricultural and natural resources and property. In addition, under the current program, the USFWS would continue to issue depredation permits based on need and recommendations from WS.

It is anticipated, based on historical need that the majority of Iowa WS' bird damage management will be at airports where bird damage has occurred or where potential hazards to the traveling public and damage to aircraft and property could occur. Iowa WS also conducts activities to reduce: 1) disease transmission risks to livestock and minimize livestock feed consumption/contamination by birds, and 2) damage at aquaculture facilities caused by piscivorous birds.

WS bird damage management would be conducted on public and private property in Iowa when the resource (property) owner or manager requests assistance. An IWDM strategy would be recommended and used, encompassing the use of practical and effective non-lethal and lethal methods to prevent or reduce damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under the current program, WS provides technical assistance and operational damage management after applying the WS Decision Model (Slate et al. 1992). Physical exclusion, localized habitat modification or harassment are recommended, as appropriate, and utilized to reduce damage or potential damage. In other situations, birds may be removed in a humane manner, using shooting, trapping, registered pesticides and other products. When determining the damage management strategy, preference is given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone is the most appropriate strategy, particularly if human health and safety are compromised (*i.e.*, aircraft/bird strike threats or disease risks).

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

Across the United States, wildlife habitat has been altered as human populations expand and land is used for human needs. These human uses and needs often compete with wildlife which increases the potential for conflicting human-wildlife interactions. In addition, certain segments of the public strive for protection of all wildlife. Such protection can create localized conflicts between humans and wildlife. The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program Final Environmental Impact Statement (EIS) (USDA 1997) summarizes the relationship in North American culture of wildlife values and wildlife damage in this way:

> *"Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife generally is regarded as providing economic, recreational and aesthetic benefits . . . , and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and values is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural, and economic considerations as well."*

With this said, both sociological and biological carrying capacities must be applied to resolving wildlife damage problems. The wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist compatibly with local human populations. Biological carrying capacity is the land or habitat's ability for supporting healthy populations of wildlife without degradation to the species' health or their environment during an extended period of time (Decker and Purdy 1988). These phenomena are especially important because they define the sensitivity of a community to a wildlife species. For any given damage situation, there are varying thresholds of tolerance exhibited by those directly and indirectly affected by the species and any associated damage. This damage threshold is a factor in determining the wildlife acceptance capacity. While Iowa may have a biological carrying capacity to support a higher population of some bird species that are analyzed in this document (see section 1.2) in many cases the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement population or damage reduction methods, including lethal methods, to alleviate damage or address threats to public health and safety.

The alleviation of damage or other problems caused by or related to the behavior of wildlife is termed wildlife damage management and recognized as an integral component of wildlife management (The Wildlife Society 1992). WS uses an adaptive Integrated Wildlife Damage Management (IWDM) approach (WS Directive 2.105[1]), commonly known as Integrated Pest Management where a combination of methods may be used or recommended to reduce wildlife damage. IWDM is the application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses (Slate et al. 1992) and the informed judgment of trained personnel. Therefore, wildlife damage management is not based on punishing offending animals, but is a means to reduce future damage. The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated and the need for bird damage management is derived from the specific threats to resources.

[1] The WS Policy Manual provides WS personnel guidance in the form of program directives. Information contained in the WS Policy Manual and its associated directives has been used throughout this EA, but has not been cited in the Literature Cited.

WS recognizes that birds have no *intent* to do harm. They utilize habitats (*i.e.,* reproduce, walk, forage, deposit feces, etc.) where they can find a *niche*. If they do *"wrongs,"* people characterize this as damage. *Wrongs*, unfortunately, are determined not merely in spatial terms but also with respect to time and other circumstances that define the *wrongness* (*i.e.,* birds living in the wilds of Iowa may not be a problem while birds inhabiting an airport facility could cause human safety concerns, potential human injuries and property damage.)

IWDM includes methods such as site-specific habitat and behavioral modification to prevent or reduce damage or may require that the offending animal(s) be removed or that local populations or groups be reduced through lethal methods. Potential environmental effects resulting from the application of various bird damage management techniques are evaluated in this EA.

Normally, individual wildlife damage management actions by WS could be categorically excluded (CE) from further National Environmental Policy Act (NEPA) analysis, in accordance with APHIS implementing regulations for NEPA (7 CFR 372.5(c), 60 Fed. Reg. 6,000, 6,003, (1995)). WS and the United States Fish and Wildlife Service (USFWS), Federal Aviation Administration (FAA), Iowa Department of Natural Resources (IDNR), Iowa Department of Agriculture and Land Stewardship (IDALS) and Iowa Department of Public Health (IDPH) Iowa Department of Transportation Office of Aviation (IDOT) are preparing this Environmental Assessment (EA) to: 1) facilitate planning, interagency coordination and the streamlining of program management; 2) clearly communicate to the public the analysis of individual and cumulative impacts of program activities; and 3) evaluate and determine if there are any potentially significant or cumulative adverse affects from the proposed program. All wildlife damage management conducted in Iowa is undertaken in compliance with relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531-1543), the Migratory Bird Treaty Act (MBTA) (16 U.S.C. Sec's. 703 - 711), and the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978). This analysis relies on existing data contained in published documents (Appendix A and Section 1.6) and USDA (1997); information from USDA (1997) is incorporated by reference.

1.2 WS PROGRAM AND THE USFWS MIGRATORY BIRD PERMITTING PROGRAM

1.2.1 WS Program: USDA is authorized and directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for USDA is the *Act of March 2, 1931* and the *Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988 (7 USC 426-426c; 46 Stat. 1468)*, as amended in the Fiscal Year 2001 Agriculture Appropriations Bill, which provides that:

"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."

Since 1931, with the changes in societal values, WS policies and programs place greater emphasis on the part of the Act discussing "*bringing [damage] under control*," rather than "*eradication*" and "*suppression*" of wildlife populations. In 1988, Congress strengthened the legislative authority of APHIS, WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control,

to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

Under the Act of March 2, 1931, and 7 U.S.C. §426c, APHIS may carry out these wildlife damage management programs itself, or it may enter into cooperative agreements with states, local jurisdictions, individuals and public and private agencies whereby they may fund and assist in carrying out such programs. Id. These laws do not grant any regulatory authority. Therefore, there are no regulations promulgated under these statutes for wildlife services or animal damage management activities.

WS' mission (www.aphis.usda.gov/ws/mission.html), developed through its strategic planning process, is: 1) "*to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* This is accomplished through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce losses and threats from wildlife;
- Collection, evaluation, and dissemination of management information;
- Cooperative wildlife damage management programs;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1999).

WS is a cooperatively funded, service-oriented program. Before any wildlife damage management is conducted, a request must be received and an *Agreement for Control* must be signed by the landowner/administrator or other comparable documents are in place. As requested, WS cooperates with land and wildlife management agencies to effectively and efficiently reduce wildlife damage according to applicable federal, state and local laws (WS Directive 2.210). WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds, when funding allows, as specified in an MOU with the USFWS; IDNR defers to federal regulations and provisions for migratory bird damage management activities.

1.2.2 USFWS Migratory Bird Permitting Program: The USFWS is the primary federal agency responsible for conserving, protecting, and enhancing the nation's fish and wildlife resources and their habitats. The USFWS mission is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Responsibilities are shared with other federal, state, tribal, and local entities; however, the USFWS has specific responsibilities for endangered species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters they administer for the management and protection of these resources.

The USFWS regulates the taking of migratory birds under the four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada), Mexico, Japan, and Russia. Regulations allowing the take of migratory birds are authorized by the Migratory Bird Treaty Act (MBTA) (16 U.S.C. Sec's. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. Sec. 712). The Acts authorize and direct the Secretary of the Interior to allow hunting,

taking, and killing of migratory birds subject to the provisions of, and in order to carry out the purposes of, the four migratory bird treaties.

The USFWS has authority for issuance of Depredation Permits (DPs) (50 CFR 21.41) "*before any persons may take, possess, or transport migratory birds for depredation control purposes."* In Iowa, those persons issued DPs by the USFWS must also acquire a permit through IDNR to legally take damage-causing bird species. In cases where intermittent damage is occurring and it is not feasible or practical for WS to provide operational assistance, WS could recommend to the USFWS the issuance of a DP to the resource owner (WS Directive 2.301). Table 1-1 provides information on the number of requests for assistance WS received in fiscal years (FY) 04, 05 and 06 for bird damage management, the number of DPs WS recommended and forwarded to the USFWS, and the number of DPs issued by the USFWS.

DPs are necessary under the MBTA and Bald and Golden Eagle Protection Act (BGEPA) for activities which *"take"* protected species. DPs are not necessary for non-lethal harassment of species protected only under MBTA, but are required for species protected under the BGEPA. Additionally, any *"take"* of a threatened or endangered (T/E) species (which could be protected under MBTA, BGEPA and the ESA) could require multiple permits under all three acts.

Table 1-1. Requests for DPs, DPs Recommended by WS (Form 37) and DPs Issued by the USWFS during FY04, FY05 and FY06.

Species*	CAGO	MALL	RBGU	HERG	RTHA	TUVU	AMKE	GHOW	DCCO	EAME	KILL	AMRO	BARS	MODO	GBHE	AMCO	BWTE
FY04																	
Requests	9	7	8	8	5	2	3	2	3	3	4	1	4	3	4	1	2
Recommend	9	7	8	8	5	2	3	2	3	3	4	1	4	3	4	1	2
Issued	9	7	8	8	5	2	3	2	3	3	4	1	4	3	4	1	2
FY05																	
Requests	10	6	10	9	4	3	2	2	4	2	4	1	2	3	3	1	2
Recommend	10	6	10	9	4	3	2	2	4	2	4	1	2	3	3	1	2
Issued	10	6	10	9	4	3	2	2	4	2	4	1	2	3	3	1	2
FY06																	
Requests	9	6	7	7	2	2	2	1	3	3	4	1	4	3	3	0	2
Recommend	9	6	7	7	2	2	2	1	3	3	4	1	4	3	3	0	2
Issued	9	6	7	7	2	2	2	1	3	3	4	1	4	3	3	0	2

*CAGO=Canada Goose, MALL=Mallard, RBGU=Ring-billed gull, HEGU=Herring gull, RTHA=Red-tailed hawk, TUVU=Turkey vulture, AMKE=American kestrel, GHOW=Great horned owl, DCCO=Double-crested cormorant, EAME=Eastern meadowlark, KILL=Killdeer, AMRO=American robin, BARS= Barn swallow, MODO=Mourning dove, GBHE=Great blue heron, AMCO=American crow, BWTE=Blue-winged teal

1.2.3 IDNR STATE PERMITTING AUTHORIZATION: The IDNR is the primary State agency responsible for conserving, protecting, and enhancing the Iowa's fish and wildlife resources and their habitats. The IDNR mission is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit to Iowans. Responsibilities are shared with other federal, tribal, and local entities; however, the IDNR has specific responsibilities for state endangered species, state game birds, as well as for lands and waters they administer for the management and protection of these resources.

The IDNR is empowered by Code of Iowa (CI) (§456A.24 (8) Specific Powers) which allows control by shooting or trapping any wild mammal, fish, birds, reptile, and amphibian for the purpose of preventing the destruction of or damage to private or public property, but shall not go upon private property for that purpose without the consent of the owner or occupant. Under CI §418A.39

(Biological Balance Maintained) the commission is designated the sole agency to determine the facts as to whether biological balance does or does not exist. The commission shall, by administrative rule, extend, shorten, open, or close seasons and set, increase, or reduce catch limits, bag limits, size limits, possession limits, or territorial limitations or further regulate taking conditions in accordance with sound fish and wildlife management principles.

1.3 PURPOSE OF THE EA

The purpose of this EA is to determine if the current program/proposed action could have a significant impact on the environment for both humans and other organisms, analyze other alternatives, coordinate efforts, inform the public, and to comply with NEPA. This EA analyzes the potential effects of bird damage management, as coordinated with the USFWS, FAA, IDNR, IDALS, IDPH, IDOT and other state and federal agencies, and private entities, as appropriate, on all lands in Iowa under MOU, Cooperative Agreement, or other comparable document. The EA also addresses the effects of bird damage management on areas where additional agreements may be signed in the future. Because the current program and the proposed action are to conduct a coordinated bird damage management program in accordance with plans, goals, and objectives developed by WS, USFWS, FAA, IDPH, IDNR, IDOT and/or IDALS to reduce damage, and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional damage management efforts could occur. Thus, this EA anticipates these additional efforts and the analyses are intended to apply to actions that may occur in any locale and at any time within Iowa as part of a coordinated program.

The purpose of bird damage management in Iowa, under the policies of WS, USFWS, FAA, IDPH, IDNR, IDOT and IDALS, is to minimize animal and human health and safety (***e.g.,*** disease transmission, aircraft collisions) risks, and bird damage to agriculture (***e.g.,*** crops, domestic animals), property (***e.g.***, structures) and natural resources (***e.g.,*** wildlife). It is anticipated, based on historical need that the majority of Iowa WS' bird damage management will be at airports in Iowa to reduce the risks of bird/aircraft strikes. Other important functions of Iowa WS are to minimize human health and safety risks, to conduct activities at livestock facilities to reduce disease transmission risks to livestock and minimize livestock feed consumption/contamination by birds and to reduce damage to aquaculture caused by piscivorous birds.

WS', USFWS's and IDNR's involvement in bird damage management provides residents of Iowa swift and more effective program delivery. Under the proposed action, bird damage management could be conducted under cooperative agreements, Memoranda of Understanding (MOU) or other comparable documents on private, federal, state, tribal, county, and municipal lands in Iowa upon request for WS assistance and in coordination with the USFWS and IDNR when requests for operational assistance are received. During FY 04, FY 05, and FY 06 Iowa WS technical and/or operational assistance was requested on 45 occasions when birds were damaging or potentially damaging property at airports (***i.e.***, aircraft) and presenting risk to human health and safety (Management Information System (MIS) 2004, 2005 and 2006).

WS identified 17 bird species for which requests for assistance were received or have provided operational bird damage management (Table 1-2). The species analyzed in this EA include: American crows (*Corvus brachyrhynchos*), Red-winged blackbirds (*Agelaius phoeniceus*), Brown-headed cowbirds (*Molothrus ater*), Common grackles (*Quiscalus quiscula*), Barn swallow (*Hirundo rustica)* Red-tailed hawk (*Buteo jamaicensis*), Bald eagle (*Haliaeetus leucocephalus*), American kestrel (*Falco sparverius*), Great horned owls (*Bubo virginianus*), Great blue herons (*Ardea herodias*), Ring-billed gulls (*Larus delawarensis*), Killdeer (*Charadrius vociferus),* Mourning dove (*Zenaida macroura*), Horned lark (*Eremophila alpestris*), Eastern meadowlark (*Sturnella magna*), Turkey vulture (*Cathartes aura*), Canada

goose (*Branta canadensis*), Mallard (domestic/wild) (*Anas platyrhynchos*), Ring-necked pheasant (*Phasianus colchicus*), and other feral, domestic and exotic birds. For emergency situations involving the protection of human health and safety (*i.e.,* disease risks, bird/aircraft strikes), WS may take action on a case-by-case basis[2]. This protocol is established via the USFWS Migratory Bird DP (permit # MB753865-0) issued to Iowa WS.

Table 1-2. Identified species and resources that WS received requests for assistance.

SPECIES	***PROTECTED RESOURCES***				
	Human Health & Safety (Aviation)	*Agriculture (aquaculture)*	*Agriculture (Field Crops)*	*Livestock (Feed or Animal Health)*	*Property (Buildings, Structures, Turf)*
American crow[1]	X		X		X
American kestrel	X				
Barn Swallow	X				
Brown-headed cowbird	X		X	X	
Canada goose[1]	X		X		X
Common grackle	X		X	X	
Eastern meadowlark	X				
Great blue heron[1]	X	X			
Great horned owl[1]	X			X	
Horned lark	X				
Killdeer	X				
Mallard[2]	X	X			X
Mourning dove	X				
Ring-necked pheasant	X		X		
Red-tailed hawk	X				
Red-winged blackbird	X		X	X	
Ring-billed gull	X				X
Turkey vulture	X				X

[1] Work will not be conducted on this species until USFWS reauthorizes take under Iowa WS' migratory bird DP.

1.4 NEED FOR ACTION

1.4.1 Need for Bird Damage Management to Protect Human Health and Safety, Livestock Health and Property

1.4.1.1 Human Health and Safety: Certain bird species are known vectors of zoonotic diseases, or they act as reservoirs that infect a host which spreads the disease to humans (Weber 1979, Conover 2002). For example, areas that are contaminated by bird feces, have a tendency to promote the growth of the fungus, *Histoplasmosis capsulatum,* which is endemic to the Unites States (Southern 1986, Cleary et al. 1996). When disturbed, fungal spores become airborne and if inhaled, may cause the respiratory disease, histoplasmosis. However, infected people are usually asymptomatic. Ornithosis (*Chlamydia psittaci*) is another respiratory disease that can be contracted by humans, livestock, and pets. Ornithosis is a viral disease that is spread through viral particles that become airborne after infected bird feces are disturbed. Various bird species are also known reservoirs for the *Flavivirus* spp. that are responsible for outbreaks of West Nile Virus (WNV) in the United States.

1.4.1.2 Human Health and Safety (Aviation): Bird hazards to aircraft and subsequent risks to

[2] These actions and any take of species that results from these actions are not anticipated to exceed several individuals of each species annually.

people represent a serious human health and safety issue. The evolution of aircraft design in the last three decades has resulted in faster and quieter aircraft. The rapid acceleration and increased speeds of jet turbine and modern propeller driven aircraft give birds less time to react to approaching aircraft. Also, the amount of air traffic has increased substantially during the last two decades. In 1990, there were roughly 1,750 reported wildlife strikes compared to more than 4,500 in 1999 in the U.S. (Cleary et al. 2002). Between 1990 and 1999, there were 2,492 wildlife strikes in the U.S. that caused damage to aircraft; of these, 85% were caused by birds and the number of airports requesting assistance from WS nationwide with wildlife issues has increased from less than 50 in 1990 to more than 400 in 2000 (Cleary et al. 2002).

The FAA is responsible for setting and enforcing the Federal Aviation Regulations (FAR) and policies to enhance public safety. For commercial airports, 14CFR Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. Airports involved in wildlife hazard management usually refer to "Wildlife Hazard Management at Airports" guidebook for conducting surveys or assessing potential wildlife risks at airports.

Bird damage to property can have important monetary impacts, such as the intake of birds into jet engines and bird strikes cause an estimated seven fatalities and $245 million damage to civilian and military aircraft each year (Conover et al. 1995). According to FAA records, 555 bird strikes to civil aircraft were reported in Iowa from 1990 through April 2006 (FAA National Wildlife Strike Database, wildlife.pr.erau.edu/public/index1.html). Iowa WS records show $400,000 worth of damage from reported wildlife strikes from 2000 – 2006 (WS Strike Database). Of those strikes reported by commercial carriers, 319 were caused by unknown bird species; the number of bird strikes to military aircraft in Iowa is unavailable. However, it is estimated that only 20 to 25% of all bird strikes are reported (Conover et al. 1995, Dolbeer et al. 1995, Linnell et al. 1996, Linnell et al. 1999). Consequently, the number of bird strikes in Iowa is most likely much higher than FAA records indicate. WS either verified or had reported 13, 30 and 50 potential threats to aviation traffic from a variety of species in FY 04, FY 05, and FY 06 respectively (MIS 2004, 2005 and 2006). WS, on a limited basis, provided assistance to airports in Iowa to resolve conflicts and reduce collisions between wildlife and aviation traffic and to protect the traveling public. This has increased significantly in FY 2007 through a cooperative agreement with the Iowa DOT. WS has since conducted initial hazard consultations for 32 airports through this cooperative agreement and anticipates extending its work with the Iowa DOT through FY2008 to conduct additional assessments and perform recommended mitigation efforts. WS has written formal wildlife hazard assessments for six airports[3] to date (with one additional airport in line for a written hazard assessment). These written hazard assessments provide information for identifying problematic species, describe seasonal trends in species abundance, list abatement recommendations, and discuss legalities surrounding the management of these species. As wildlife/aviation hazards are identified at different airports throughout Iowa, the number of requests for assistance may increase. The bird species discussed/analyzed in this EA occur in Iowa and could occur on most airports in Iowa. If these birds present an aircraft/bird strike hazard or potential hazard, WS would respond with appropriate actions. Those actions could be non-lethal or lethal depending on the case-by-case situation as evaluated by WS.

1.4.1.3 Property: Property damage caused by birds can entail numerous resources and usually is

[3] WS completed six full WHA's in Iowa at the following airports: Des Moines International, Waterloo Regional, Dubuque Regional, Eastern Iowa, Cedar Rapids, Pella Municipal Keokuk. WS conducted one to five-day formal site visits resulting in formalized recommendation at 32 non-certificated airports.

not important nationally but may be significant on a local or regional basis. Woodpecker damage to residential dwellings on a national scale is minimal; however, on a smaller (local) scale, woodpecker damage annually causes thousands of dollars of structural damage. During FY 04 through FY 06, Iowa WS received one complaint from resource owners that reported birds caused more than $100 of damage (MIS 2004, 2005, and 2006).

1.4.1.4 Nuisances: Certain bird species and their associated nesting material and feces may create nuisances for property owners or safety hazards. Birds, at times, may create a nuisance with their nests and feces when they nest or roost in large numbers on buildings or homes. Their nests may foul machinery and create aesthetic problems, especially when they fall to the ground; they may also create fire hazards when nesting material is placed near electrical wiring and light fixtures. Accumulations of feces may produce an objectionable odor, accelerate deterioration of buildings and increase maintenance costs. Feces deposited on park benches, cars, statues, and unwary pedestrians are unsightly and can be a human health and safety issue. Birds may also damage buildings by pecking foam insulation and create aesthetic problems with their droppings and nesting materials. Gulls become nuisances when they attempt to gain food from people eating outdoors (Dolbeer et al. 1990).

1.4.2 Need for Bird Damage Management to Natural Resources: Encroachment by some bird species is a concern of some resource management agencies. Brown-headed cowbirds parasitize songbird nests, leading to concern by some wildlife biologists for the well-being of neotropical migrant species (Brown 1994). With endangered bird species, such parasitism can cause enough nest failures to jeopardize the host species. Cowbirds have parasitized more than 220 host species, ranging from the Black-capped vireo (*Vireo atricapillus*) and Wood thrush (*Hylocichla mustelina*) to the Blue-winged teal (*Anas discors*) and Red-headed woodpecker (*Melanerpes erythrocephalus*).

Ring-billed gulls encroaching on the nesting habitat of other migratory bird species is also a concern. This is especially true for the Common tern (*Sterna hirundo*), a species of management concern. Gulls arrive at colony sites well in advance of many other avian species and simply take over traditional nesting sites and thus force the other species to nest in less suitable habitat or to abandon the site (Courtney and Blokpoel 1983). The potential for gull predation on Piping plover (*Charadrius melodus*) chicks is also a concern to management agencies (USFWS 2000). The Piping plover is listed as an endangered species and in Iowa, where it occurs only as a migrant.

Because of the predatory or invasive nature of some bird species, WS could foreseeably be requested to help reduce conflicts for the overall protection and conservation of some bird species.

1.4.2.1 Avian Influenza Surveillance and Early Detection: AI is caused by a virus in the Orthomyxovirus group. Viruses in this group vary in the intensity (virulence) of illness they may cause. Wild birds, in particular waterfowl and shorebirds, are considered to be the natural reservoirs for AI (Clark 2003). Most strains of AI rarely cause severe illness or death in birds although the H5 and H7 strains tend to be highly virulent and very contagious (Clark 2003).

Recently, the occurrence of highly pathogenic (HP) H5N1 AI virus has raised concerns regarding the potential impact on wild birds, domestic poultry, and human health should it be introduced into the U.S. One proposed method of introduction that may allow HP H5N1 AI to spread over a large geographical area is infection of migratory waterfowl followed by evolution into a strain that could transmit efficiently between humans (USGS 2005). In fact, it is thought that a change occurred in a low pathogenicity AI virus of wild birds, allowing the virus to infect chickens, followed by further change into the HP H5N1 AI. Highly pathogenic H5N1 AI has been

circulating in Asian poultry and fowl, resulting in death to these species. Highly pathogenic H5N1 AI likely underwent further changes, causing infection in additional species of birds, mammals, and humans. More recently, this virus moved back into wild birds, resulting in significant mortality of some species of waterfowl, gulls, and cormorants. This is only the second time in history that a highly pathogenic form of AI has been recorded in wild birds. Potential routes for introduction of the virus into the U. S. include illegal movement of domestic or wild birds, contaminated products, and the migration of infected wild birds.

An interagency National Early Detection System (NEDS) was developed to address detection of the virus in all the North American flyways. The nationwide surveillance effort for HP H5N1 detection, a component of NEDS, was designed to provide an early warning for potentially catastrophic mortality in North American wild birds and poultry, and minimize the potential for human exposure.

As expected, this nationwide surveillance effort, which commenced in 2006, has detected some instances of low pathogenic AI viruses. This is not surprising, given that waterfowl and shorebirds are considered to be the natural reservoirs for AI. Tens of thousands of birds have been tested, with no evidence that the HP H5N1 AI is found in North America.

1.5 Summary of Current and Proposed Action

WS, USFWS, FAA, IDNR, IDALS, IDOT and IDPH propose to continue to administer an adaptive IWDM program to alleviate bird damage to agriculture (*e.g.,* crops and domestic animals), property (*e.g.,* structures), natural resources (*e.g.,* wildlife competition), and animal and human health and safety *(e.g*., disease transmission, aircraft/bird strikes). It is anticipated, based on historical need that the majority of Iowa WS' bird damage management will be at airports where bird damage has occurred or where potential hazards to the traveling public and damage to aircraft and property could occur. Iowa WS also conducts activities to reduce: 1) disease transmission risks to livestock and minimize livestock feed consumption/contamination by birds, and 2) damage at aquaculture facilities caused by piscivorous birds.

An IWDM program would be implemented on private and public lands of Iowa[4] where a need exists, a request is received and funding is available. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods to prevent or reduce damage while minimizing harmful effects of damage management measures on humans, other species, and the environment. Under the proposed action, WS would continue to provide technical assistance and operational damage management, including non-lethal and lethal management methods using the WS Decision Model[5] (Slate et al. 1992) to help determine the most appropriate action(s) to take. When appropriate, localized habitat modifications, harassment, repellents, and physical exclusion would be recommended and utilized to reduce bird damage. In other situations, birds could be removed as humanely as possible by utilizing shooting, restricted-use pesticides and live-capture followed by relocation[6] or euthanasia under permits issued by the USFWS and IDNR. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage or potential damage situation. The most appropriate response

[4] This EA addresses bird damage management on a statewide basis on lands under cooperative agreement or other comparable documents because wildlife, especially birds in this case, are jointly managed by the IDNR and USFWS under statewide statutes, laws, regulations and policies. WS would consult with the IDNR and USFWS on a regular basis to ensure there are no adverse impacts to wildlife populations or other resources of the state.

[5] The WS Decision Model is not a written process but rather a mental problem solving process to determine appropriate management actions to take.

[6] It is often unwise, unnecessary and biologically unsound to relocate damaging birds because they are often abundant and this would potentially cause damage in the new location or they would return to the original location. WS, however, would consider relocating birds if it is deemed biologically sound and a permit was issued by the IDNR or USFWS.

could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. Bird damage management would be conducted in the state, when requested and after consultation with the USFWS, IDNR, IDOT, FAA, IDALS and/or IDPH, as appropriate, on private or public property after an *Agreement for Control* or other comparable document has been completed. During FY 04, 05, and 06, WS provided technical assistance services to residents across the entire state of Iowa. In addition, WS consultations with the USFWS were conducted to ensure no adverse effect to T/E species (J. Millard, Ecological Services, USFWS email to E. Colboth, WS, September 6, 2006 and Interagency Consultation).

1.6 Relationship of This EA to Other Management and Environmental Documents

1.6.1 WS Programmatic EIS: WS issued a programmatic EIS which analyzed program activities (USDA 1997) and Record of Decision on the National APHIS-WS program. This EA incorporates information by reference from USDA (1997).

1.6.2 Final Environmental Impact Statement: Resident Canada Goose Management: The USFWS has issued a Final EIS on the management of resident Canada geese (USFWS 2005). Pertinent and current information available in the EIS has been incorporated by reference into this EA. The EIS may be obtained by contacting the Division of Migratory Bird Management, USFWS, 4401 North Fairfax Drive, MBSP-4107, Arlington, Virginia or by downloading it from the USFWS website a http://www.fws.gov/migratorybirds/issues/cangeese/finaleis.htm.

1.6.3 Starling, Pigeon, Sparrow Damage Management EA and Finding of No Significant Impact: In 2005, the Iowa WS program issued a Finding of No Significant Impact and a Final Environmental Assessment entitled, "Starling, Pigeon and Sparrow Damage Management in Iowa," which evaluated alternatives and impacts to the environment and selected an Integrated Wildlife Damage Management (IWDM) approach to manage damage associated with those species (USDA 2005)**.**

1.6.4 Executive Order (EO) 13186 and MOU between USFWS and WS: EO 13186 directs agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between agencies and American Indian tribes. A national-level MOU between the USFWS and WS is being developed to facilitate the implementation of Executive Order 13186.

1.6.5 Invasive Species EO 13112: Authorized by President Clinton, EO 13112 establishes guidance to agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, 4) provide for environmentally sound control, and 5) promote public education on invasive species.

1.7 Decision to Be Made

Based on agency relationships, MOUs and legislative direction, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The USFWS, IDOT, FAA, IDNR, IDPH and IDALS had input during preparation of the EA to ensure an interdisciplinary approach in compliance with NEPA and agency mandates, policies and regulations. As a cooperating agency, the USFWS may

adopt this EA and make and document their own decision.

Based on the scope of this EA, the decisions to be made are:

- Should WS, USFWS, FAA, IDNR, IDPH, IDOT and IDALS conduct a coordinated bird damage management program in Iowa to alleviate damage to agriculture, property, natural resources, and human health and safety?
- What mitigation measures should be implemented by WS, USFWS, FAA IDNR, IDALS, IDOT and IDPH?
- Would the proposed action have significant impacts on the quality of the human environment and therefore, require preparation of an EIS?

1.8 Scope of This Analysis

1.8.1 Actions Analyzed: This EA evaluates bird damage management to protect human and animal health and safety, property, agriculture, and natural resources as coordinated with the USFWS, FAA, IDNR, IDPH, IDOT and/or IDALS.

1.8.2 American Indian Lands and Tribes: Currently, Iowa WS does not have any MOUs with any American Indian tribes. If WS enters into an agreement with a tribe for mammal damage management, this EA would be reviewed and supplemented, if appropriate, to insure compliance with NEPA. MOUs, agreements and NEPA documentation would be prepared as appropriate before conducting activities on tribal lands.

1.8.3 Resources Not Currently Protected by WS Bird Damage Management: The current bird damage management program operates on a small percentage of properties in Iowa. This EA analyzes effects not only at the current program level, but at an expanded level, should individuals or agencies request assistance. Any program expansions are anticipated to be small, with no additional adverse effects.

1.8.4 Period for which this EA is Valid: If it is determined that an EIS is not needed, this EA will remain valid until Iowa WS and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year to ensure that the EA analysis is sufficient.

1.8.5 Site Specificity: This EA emphasizes major issues as they relate to specific areas whenever possible; however, many issues apply wherever bird damage, or potential bird damage occurs and management actions are taken. WS personnel use the WS Decision Model (Slate et al. 1992) as the *"on the ground"* site-specific procedure for each damage management action conducted by WS. The Decision Model is a thought process that guides WS though the analysis and development of the most appropriate individual strategy to reduce damages and detrimental environmental effects from damage management actions (see Chapter 3, Section 3.3.3 for a description of the Decision Model). The Decision Model (Slate et al. 1992) and WS Directive 2.105 describe the site-specific thought process that is used by WS. Decisions made using the model would be in accordance with plans, goals, and objectives of WS, USFWS, FAA, IDNR, IDPH, IDOT and/or IDALS and any standard operating procedures (SOP) described herein and adopted or established as part of the decision.

WS, USFWS, FAA, IDNR, IDPH, IDOT and IDALS analyzed the current program and proposed action, and the other alternatives in this EA against the issues that were raised. These issues were analyzed at levels that are *"site specifically"* appropriate for this action in Iowa. Determining effects requires that WS look at the *context* of the issue and *intensity* of the action. Birds range over a large

geographic area that includes different land ownerships and political boundaries. Damage management actions are conducted on a much smaller portion of the habitat occupied by the target birds. As professional wildlife biologists, WS, USFWS and IDNR analyze effects of management actions on bird populations, understanding that the damage situation with birds may change at any time in any location because wildlife populations are dynamic and mobile.

In summary, WS, USFWS, FAA, IDNR, IDPH, IDOT and IDALS have prepared an EA that provides as much information as possible to address and predict the locations of potential bird damage management actions and coordinates efforts with WS, USFWS and IDNR, to ensure that native bird populations remain healthy and viable in the state. Thus, the EA addresses substantive environmental issues pertaining to bird damage management in Iowa. To reduce damages, WS provides technical assistance and demonstrations to help prevent the need for operational damage management. WS can and does provide an analysis of effects of their actions and effects to reduce bird damage within the scope of the EA. The site-specificity problem occurs when trying to predict damage locations before the damage actually occurs. By using the Decision Model (Slate et al. 1992), WS believes it meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to accomplish its mission. WS determined that a more detailed and more site-specific level of analysis would not substantially improve the public's understanding of the proposal, the analysis, the decision-making process, and pursuing a more site-specific and more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995). In addition, in terms of considering cumulative impacts, one EA analyzing effects in Iowa provides a better analysis than multiple EA's covering smaller zones within Iowa.

1.8.6 Summary of Public Involvement: Issues related to the proposed action were initially developed by WS. As part of WS' environmental analysis process, and as required by the Council on Environmental Quality (CEQ 1981) and APHIS-NEPA implementing regulations, this document and its Decision will be made available to the public through "Notices of Availability" (NOA) published in local media, on the APHIS website and through direct mailings of NOA to parties that have specifically requested to be notified; the EA will also be available on the APHIS website. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA should be revisited and, if appropriate, revised prior to issuance of a final Decision.

1.9 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of four Chapters and three Appendices. Chapter 2 discusses the issues, issues not analyzed in detail, and the affected environment. Chapter 3 describes each alternative, alternatives not considered in detail and SOPs. Chapter 4 analyzes the environmental impacts associated with each alternative considered in detail. Chapter 5 is a list of preparers, consultants and reviewers. Appendix A is the literature cited, Appendix B discusses the legal authorities of federal and state agencies in Iowa, and Appendix C describes bird damage management methods available for use in Iowa.

CHAPTER 2: AFFECTED ENVIRONMENT AND ISSUES

2.1 INTRODUCTION

Chapter 2 discusses the issues, including issues that will receive detailed analysis in Chapter 4 (Environmental Consequences), and issues that will not be considered in detail, with the rationale. Pertinent portions of the affected environment will be addressed in this chapter in the discussion of issues used to develop SOPs. Additional affected environments will be incorporated into the discussions of the environmental impacts in Chapter 4.

2.2 AFFECTED ENVIRONMENTS

2.2.1 Airports: Collisions between aircraft and wildlife are a concern throughout the world because they threaten passenger safety (Thorpe 1996), result in lost revenue and costly repairs to aircraft (Linnel et al. 1996), and can erode public confidence in airport transportation (Conover et al. 1995). Birds as a group represent the greatest hazard to aircraft, and therefore are considered a serious threat to human safety when found on or near airports (FAA National Wildlife Strike Database, wildlife.pr.erau.edu/public/index1.html).

2.2.2 Urban and Suburban Areas: Public and private properties in urban/suburban areas (including public utilities) may also be affected when birds cause damage to landscaping, natural resources, and property or affect human health and safety.

2.2.3 Agricultural and Rural Areas: Other areas of proposed action include livestock facilities, or nurseries, and rural areas where birds are causing or potentially cause disease transmission and damage to agriculture crops, livestock and feed, aquaculture, property, and natural resources.

2.3 ISSUES ANALYZED IN DETAIL

The following issues have been identified as areas of concern requiring detailed analysis in Chapter 4 of this EA:

- Cumulative Effects of WS Bird Damage Management on Target Species Populations
- Effects of WS Bird Damage Management on Non-target Species Populations, Including T/E Species
- Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Animals
- Efficacy of WS Bird Damage Management Methods

2.3.1 Cumulative Effects of WS Bird Damage Management on Target Species Populations: A common concern among members of the public and wildlife professionals, including WS personnel, is the effect of bird damage management on the target species population. WS' take of target species is small in comparison to the overall population of these species and many species WS works with are considered *anthropogenically abundant* (Conover 2002). Quantitative population data for most species are not available; however, population trend data *(i.e.,* qualitative) exist from the breeding bird survey (BBS) data base (Sauer et al. 2007) for most species. The anticipated take of most MBTA-protected species in a year would be small enough that impacts on populations would not be significant. WS routinely monitors take of all birds and annually reports figures for MBTA-protected species to the USFWS. A detailed analysis concerning WS' effect on target species populations is conducted in Chapter 4.

2.3.2 Effects of WS Bird Damage Management on Non-target Species Populations, Including

T/E Species: WS uses an adaptive IWDM approach to reduce effects on non-target species' populations which is described in Chapter 3. To reduce the risks of adverse effects to non-target species, WS selects methods that are as target-selective as possible or apply such methods in ways to reduce the likelihood of adversely affecting non-target species populations. For trapping activities, WS selects locations that are highly used by the target species and uses baits that are preferred by the target species.

WS also uses trained professional employees to conduct bird damage management programs in Iowa. Employees would monitor work areas where bird damage management is scheduled to be conducted and notify the USFWS if a federally listed species was observed. There are 20 federally listed T/E species in Iowa. WS prepared a BA and determined the proposed bird damage management program has no effect on all federally listed species in Iowa.

2.3.3 Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets: Shooting with shotguns, air rifles, and other firearms is selectively used for the target species and helps to reinforce bird scaring and harassment efforts. Firearm use is very sensitive and a concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years (WS Directive 2.615). WS employees, who carry firearms as a condition of employment, are also required to certify that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Harassment refers to tactics that alter the behavior of wildlife to disperse from the area and reduce damage. Some of the methods used to disperse birds include: auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, lasers, spotlights, scarecrows, mylar tape, dogs and audio distress/predator vocalizations. However, birds quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics (Bomford and O'Brien 1990).

In addition, WS may use several types of traps to capture target birds. These include: clover, funnel, and common pigeon traps, decoy traps, nest box traps, mist nets, cannon and rocket nets, net guns, pole traps, bal-chatri traps and snap traps. These traps are live traps or cage traps; consequently, animals can be released unharmed and the traps pose no risks to the public or domestic pets when used appropriately.

2.3.4 Efficacy of WS Bird Damage Management Methods: Under the current and proposed Iowa WS program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992), WS Directives and relevant federal and state laws and regulations. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method, and the guidance provided by WS Directives and policies for WS personnel.

WS personnel are trained in the effective use of each bird damage management method. All WS personnel applying pesticides are certified by IDALS as restricted-use pesticide applicators. If shooting is determined to be an effective method for a specific bird damage problem, all personnel utilizing firearms receive training on the safe use of firearms (see Section 2.3.3).

WS believes that it is important to maintain the widest possible selection of damage management methods to effectively resolve bird damage problems. Some methods may be more or less effective,

or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors (see Appendix C for a more detailed discussion of methods).

2.4 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.4.1 WS' Impact on Biodiversity: No WS bird damage management in Iowa is conducted to eradicate or adversely impact populations of any native wildlife species. WS operates according to international, federal, and state laws and regulations (and management plans thereof) enacted to ensure species viability. In addition, any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. The effects of the current WS program on biodiversity are minor and not significant nationwide, statewide, or regionally (USDA 1997). The Iowa WS operational program targets birds primarily at airports. WS' take of any bird species analyzed in this EA is a small proportion of the total population and insignificant to the viability and health of the population (Sauer et al. 2007).

2.4.2 Humaneness of WS Bird Damage Management Methods: The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if *" . . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*

Suffering is described as a " . . . *highly unpleasant emotional response usually associated with pain and distress*." However, suffering " . . . *can occur without pain . . .* ," and ". . . *pain can occur without suffering . . .*" (American Veterinary Medical Association (AVMA) 1987). Because suffering carries with it the implication of a time frame, a case could be made for ". . . *little or no suffering where death comes immediately . . .*" (California Department of Fish and Game (CDFG) 1999), such as shooting.

Defining pain as a component in humaneness of WS methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would ". . . *probably be causes for pain in other animals . . .* " (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1999).

Pain and suffering, as it relates to WS damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since "*. . . neither medical or veterinary curricula explicitly address suffering or its relief*" (CDFG 1999).

Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of human and animal suffering with the constraints imposed by current technology and funding.

WS has improved the selectivity and humaneness of management techniques through research and development and research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some bird damage management methods are used in situations where non-lethal damage management methods are not practical or effective.

Iowa WS employs experienced and professional personnel who implement management actions in a humane manner given the constraints of current technology, staffing and funding. SOPs used to maximize humaneness are listed in Chapter 3.

2.4.3 Effects of WS Bird Damage Management Methods on Aesthetic Values: The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The American public is no exception and today a large percentage of households have pets. However, some people may consider individual wild animals and birds as "pets" or exhibit affection toward these animals, especially people who enjoy coming in contact with wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife.

There is some concern that the proposed action or the action alternatives would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Wildlife generally is regarded as providing economic, recreational and aesthetic benefits (Decker and Goff 1987, USDA 1997), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics are truly subjective in nature, dependent on what an observer regards as beautiful (see Section 1.1).

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (*e.g.*, wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (*e.g.*, reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to natural ecosystems (*e.g.*, ecological, existence, bequest values) (Bishop 1987). Direct benefits are derived from a user's personal relationship to animals and may take the form of direct consumptive use (using up the animal) or non-consumptive use (photography, viewing the animal in the wild or in a zoo) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is the knowledge that the animals exist (Decker and Goff 1987).

Iowa WS recognizes that all wildlife has aesthetic value and benefit. WS only conducts bird damage management at the request of the affected home/property owner or resource manager when a need is established, and management actions are carried out in a caring, humane, and professional manner.

2.4.4 Bird Damage is a Cost of Doing Business – a "Threshold of Loss" Should Be Established Before Allowing any Lethal Bird Damage Management: WS is aware of concerns that bird damage management should not be allowed until economic losses become unacceptable. However, this type of policy would be inappropriate to apply to public health and safety situations. In addition, because only a certain level (or threshold) of loss can be expected and tolerated by agriculture producers and property owners, WS has the legal responsibility and direction to respond to requests for bird damage management, and it is program policy to aid each requester to minimize losses. The WS Decision Model (Slate et al. 1992) is used to determine an appropriate strategy.

Furthermore, in a ruling for *Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest*

Supervisor for the Dixie NF, et al., the United States District Court of Utah denied plaintiffs' motion for preliminary injunction. In part the court found that it was only necessary to show that damage from wildlife is threatened, to establish a need for wildlife damage management (U.S. District Court of Utah 1993).

2.4.5 Bird Damage Management Should Not Occur at Taxpayers Expense, but Should Be Fee Based: Funding for WS comes from many sources besides federal appropriations. Such non-federal sources include various state appropriations, local government funds (county or city), and private funds that are all applied toward program operations. WS was established by Congress as the program responsible for providing wildlife damage management to the people of the United States. Federal, state and local officials have decided that WS activities should be conducted by appropriating funds. Additionally, wildlife damage management is an appropriate sphere of activity for government programs, since wildlife is publicly owned and wildlife management is a government responsibility. A commonly voiced argument for publicly funded wildlife damage management is that the public should bear the responsibility for damage to private property caused by public wildlife. The protection of agricultural resources, property, and public health and safety will always be conducted by someone. A federal WS program provides a service to the agricultural producers, protects property, natural resources, and public health and safety, and conducts an environmentally, economically, and biologically sound program in the public interest.

Currently, Iowa WS provides free bird damage management technical assistance to citizens, businesses, and government agencies. Operational damage management may be initiated when the problem cannot effectively be resolved through technical assistance, when *Agreements for Control* are signed and when necessary funds are made available. WS operational bird damage management in Iowa is offered as a free public service, unless the scale or scope of the problem dictates a fee-based system.

2.4.6 Impacts of West Nile Virus (WNV) on Bird Populations: WNV is a mosquito–borne virus that emerged in recent years in temperate regions of North America, with the first appearance of the virus in North America occurring in New York City in 1999 (Morbidity and Mortality Weekly Report (MMWR) 2002, Rappole et al. 2000). Mosquitoes acquire WNV from birds and pass it on to other birds, animals, and people. Mammals can become infected if bitten by an infected mosquito, but individuals in most species of mammals do not become ill from the virus. The most serious manifestation of WNV is fatal encephalitis in humans, horses, and birds.

WNV has spread across the United States since 1999 and was reported in 44 states and the District of Columbia in 2002 (MMWR 2002). WNV is typically transmitted between birds and mosquitoes.

WNV has been detected in dead birds of at least 317 species (Center for Disease Control (CDC) 2003, www.cdc.gov.ncidod/dvbid/westnile/birds&mammals.htm). Although birds infected with WNV can die or become ill, most infected birds survive and may subsequently develop immunity to the virus (CDC 2003, www.cdc.gov.ncidod/dvbid/westnile/birds& mammals.htm, Cornell University 2003, http://environmentalrisk.cornell.edu/WNV/Summary2. cfm). USGS does not anticipate that the commonly seen species, such as crows and blue jays, will be adversely affected by WNV to the point that these bird species will disappear from the United States (USGS-NWHC 2003, www.nwhc.usgs.gov/research/ west_nile.html).

2.4.7 Lethal Bird Damage Management is Futile because 50-65% of Many Species' Populations Die Each Year: Because natural mortality in many bird species is 50-65% per year, some persons argue that this shows lethal bird damage management is futile (USDA 1997). However, the rate of natural mortality has little or no relationship to the effectiveness of bird damage

management because natural mortality generally occurs randomly throughout a population and throughout the course of a year. Natural mortality is too gradual in concentrations of depredating birds to adequately reduce damage. It is apparent that the rate of mortality from bird damage management in Iowa is well below the extent of any natural fluctuations in overall annual mortality and is, therefore, inconsequential to regional populations. The resiliency of bird populations does not mean individual bird damage management actions are not successful to reduce damage, but that periodic bird damage management actions are necessary in many damage situations.

2.4.8 Appropriateness of Preparing an EA (Instead of an EIS) For Such a Large Area: Some individuals might question whether preparing an EA for an area as large as the State of Iowa would meet the NEPA requirements for site specificity. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA analyzing impacts for the entire state provides a better analysis than multiple EA's covering smaller zones. In addition, Iowa WS conducts bird damage management in a very small portion of the state where damage is occurring or likely to occur and where assistance is requested.

2.4.9 Cost Effectiveness of Bird Damage Management: Perhaps a better way to state this issue is by the question "Does the value of damage avoided equal or exceed the cost of providing bird damage management?" CEQ does not require a formal, monetized cost-benefit analysis to comply with NEPA (40 CFR 1502.23) and consideration of this issue is not essential to making a reasoned choice among the alternatives being considered. USDA (1997, Appendix L) states:

"Cost effectiveness is not, nor should it be, the primary goal of the APHIS WS program. Additional constraints, such as the environmental protection, land management goals, and others, are considered whenever a request for assistance is received. These constraints increase the cost of the program while not necessarily increasing its effectiveness, yet they are a vital part of the APHIS WS Program."

An analysis of cost-effectiveness in many bird damage management situations is exceedingly difficult or impossible to perform because the value of benefits is not readily determined. For example, the potential benefit of eliminating birds from nesting in industrial buildings could reduce incidences of illness among unknown numbers of building users. Since some bird-borne diseases are potentially fatal, or severely debilitating, the value of the benefit may be high. However, no studies of disease problems with and without bird damage management have been conducted, and, therefore, the number of cases *prevented* by effective bird damage management is not possible to estimate. Also, it is rarely possible to conclusively prove that birds are responsible for individual disease cases or outbreaks.

Another example is the management of some wildlife species to protect other wildlife species, such as T/E species. Civil values have been assigned for many common species of wildlife and can be used to calculate their value. In the case of T/E species, their value has been judged "*incalculable*" (*Tennessee Valley Authority vs Hill*, US Supreme Court 1978), making it more difficult to specifically quantify the economic benefit to restore or protect T/E species.

2.4.10 Bird Damage Management Should Be Conducted by Private Nuisance Wildlife Control Agents: Private nuisance wildlife control agents could be contacted to reduce bird damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, they are not required to comply with NEPA, or because they prefer to use a private business rather than a

government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses, airport managers, and cities and towns may prefer to use WS because of security and safety issues, legal requirements to be accountable to the public through NEPA compliance and reduced administrative burden.

CHAPTER 3: ALTERNATIVES

3.1 INTRODUCTION

This Chapter consists of five parts: 1) introduction, 2) description of alternatives considered and analyzed in detail, including the No Action/Proposed Action (Alternative 1), 3) bird damage management strategies and methods available to WS in Iowa, 4) alternatives considered but not analyzed in detail with the rationale, and 5) SOPs for bird damage management techniques. Three alternatives were recognized, developed and analyzed in detail by WS, the USFWS, FAA IDNR, IDOT, IDPH and IDALS. Three additional alternatives were considered but not analyzed in detail.

3.2 DESCRIPTION OF THE ALTERNATIVES

3.2.1 Alternative 1 – Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action). The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with the CEQ's (1981) definition.

The current and proposed program is an adaptive integrated Iowa WS bird damage management program for the protection of public health and safety, agricultural and natural resources, and property. It is anticipated, based on historical need that the majority of Iowa WS' bird damage management will be at airports where bird damage has occurred or where potential hazards to the traveling public and damage to aircraft and property could occur. Iowa WS also conducts activities to reduce: 1) disease transmission risks to livestock and minimize livestock feed consumption/contamination by birds, 2) damage at aquaculture facilities caused by piscivorous birds, and 3) property damage. Currently, managers/owners of aquaculture facilities in Iowa deal with their own bird depredation problems through DPs issued by USFWS after WS evaluates each case and recommends site-specific take figures.

A major goal of the program is to minimize bird-related losses. To meet this goal, WS would continue to respond to requests for assistance with, at a minimum, technical assistance, or where appropriate when permitted by the USFWS and IDNR, and when cooperative funding is available, operational damage management whereby WS personnel would conduct bird damage management actions. City managers, airport managers, agricultural producers, property owners and others requesting assistance would be provided information regarding the use of non-lethal and lethal techniques, as appropriate. Non-lethal methods include, but are not limited to: habitat/behavior modification, decoy and other live traps, exclusionary devices, nest destruction, hazing/frightening devices, chemical repellents, and alpha-chloralose (AC). Lethal methods considered by WS include: shooting, egg addling/destruction, and American Veterinary Medical Association-approved euthanasia techniques, such as CO_2. WS may recommend hunting or DPs to resource owners when these strategies are deemed appropriate for specific bird depredation problems. Bird damage management would be allowed in the state, when requested, on private or public property where a need has been demonstrated and an *Agreement for Control* or other comparable document has been completed. All management actions would comply with appropriate laws, orders, policies, and regulations.

3.2.2 Alternative 2 – Technical Assistance Only Program. This alternative would not allow for WS operational bird damage management in Iowa. WS would only provide technical assistance and make recommendations when requested. Producers, property owners, agency personnel, or others

could conduct bird damage management using traps**,** shooting, Avitrol[7], or any non-lethal method that is legal. Currently, AC is available only for use by WS personnel. Therefore, use of this chemical by private individuals would be illegal.

This "*technical assistance only"* alternative would place the immediate burden of operational damage management on state agencies, individuals and requesters. Individuals experiencing bird damage would, independently or with WS recommendations, carry out and fund damage management activities. Individual producers could implement bird damage management as part of the cost of doing business, or a state or other federal agency could assume a more active role in providing operational damage management assistance.

If Alternative 2 was selected, operational bird damage management would be left to state or other federal agencies and individuals. Some agencies or individuals may choose not to take action to resolve bird damage. Other situations may warrant the use of legally available management methods because of public demands, mandates, or individual preference. Methods and devices could be applied by people with little or no training and experience, and with no professional oversight or monitoring for effectiveness. This in turn could require more effort and cost to achieve the same level of problem resolution, and could cause harm to the environment, including a higher take of non-target animals, and illegal use of pesticides could be greater than present.

3.2.3 No WS Bird Damage Management Program

This alternative would terminate the WS program for bird damage management (operational and technical assistance) on all land classes in Iowa. However, other federal, state and county agencies and private individuals could conduct bird damage management, but requesters of WS services would not have WS input. WS would not be available to provide technical assistance or make recommendations to airport and landfill managers, property owners, agricultural producers or others requesting assistance. In some cases, damage management methods applied by non-WS personnel could be used contrary to their intended or legal use. In addition, AC is available only for use by WS employees. Therefore, use of this product by private individuals would be illegal; however, Avitrol could be used by any state-certified restricted-use pesticide applicator.

A *"no control"* alternative was also evaluated in USDA (1997).

3.3 BIRD DAMAGE MANAGEMENT STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN IOWA

The strategies and methodologies described below are common to Alternatives 1 and 2. Under Alternative 2, WS personnel would only provide technical assistance recommendations and conduct demonstrations. Alternative 3 would terminate both WS technical assistance and operational bird damage management in Iowa. The methods used or recommended by WS would be supported by the WS Decision Model (Slate et al. 1992).

3.3.1 Integrated Wildlife Damage Management. The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement effective management methods in a cost-effective[8] manner while minimizing the potentially harmful effects on humans, target and non-target species,

7 Avitrol could only be used by state certified pesticide applicators in Iowa.

8 The cost of management may be secondary because of environmental, legal, human health and safety, animal welfare, or other concerns.

and the environment. IWDM draws from an array of options to create a combination of methods for the specific circumstances. IWDM may incorporate cultural practices (*i.e.*, animal husbandry), small scale habitat modification (*i.e.*, exclusion), animal behavior modification (*i.e.*, hazing/frightening), local population reduction, or any combination of the aforementioned, depending on the characteristics of the specific damage problem. In selecting management techniques for specific damage situations consideration is given to:

- Species responsible for the damage
- Magnitude of the damage
- Geographic extent of the damage
- Duration and frequency of the damage
- Prevention of future damage
- Presence of non-target species
- Impacts to the environment

3.3.2 The IWDM Strategies That WS Employs

3.3.2.1 Technical Assistance Recommendations involve the implementation of damage management actions by the requester; however, WS personnel provide information, demonstrations, and advice on available and appropriate wildlife damage management methods. Technical assistance includes demonstrations on the proper use of management devices (*i.e.*, propane exploders, exclusionary devices, pyrotechnics, etc.) and information on animal husbandry, habitat management, and animal behavior modification that could reduce damage. Technical assistance is generally provided following consultation or an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and practical application.

3.3.2.2 Operational Damage Management Assistance is the conduct or supervision of bird damage management by WS personnel. Operational damage management assistance is initiated when the problem cannot effectively be resolved through technical assistance, and when *Agreements for Control* or other comparable documents provide for WS operational damage management. The initial investigation defines the nature, history, extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of WS personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or the problem is complex requiring the direct supervision of wildlife professional. WS considers the biology and behavior of the damaging species and other factors. The recommended strategy(ies) may include any combination of preventive and corrective actions that could be implemented by the requester, WS, or other agency personnel, as appropriate. Two strategies are available: 1) preventive damage management and 2) corrective damage management.

3.3.2.2.1 Preventive Damage Management is the practice of applying wildlife damage management strategies before damage occurs, based on historical problems and the probability of the damage recurring or an imminent threat to public health, or disease transmission. As requested and appropriate, WS personnel provide information and conduct demonstrations or take action to prevent historical losses from recurring or reduce the risk of potential losses from occurring. Examples would be: hazing birds at airports, applying bird-proof netting over fruit trees before the fruit becomes attractive to birds and the removal of a bird(s) from a food processing plant, restaurant, industrial plant, or a feedlot before the bird(s) has/have caused damage or threatened public or livestock health.

3.3.2.2.2 Corrective Damage Management is applying wildlife damage management to stop or reduce current losses. As requested and appropriate, WS personnel provide information and conduct demonstrations, or with the appropriately signed *Agreement for Control* or other comparable document, take action to prevent additional losses. For example, in areas where birds are consuming livestock feed, WS may provide information to the resource owner about exclusionary methods, animal husbandry, mechanical scare devices and pyrotechnics, or conduct operational damage management to reduce losses.

3.3.2.3 Educational Efforts. Education is an important element of WS program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures, instructional courses, and demonstrations are provided to producers, homeowners, state and county agents, colleges and universities, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

3.3.2.4 Research and Development. The National Wildlife Research Center (NWRC) functions as the research arm of WS, providing scientific information and developing methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. The NWRC was instrumental in the development of the repellent methyl anthranilate (MA) and DRC-1339, and is currently testing new experimental agents that inhibit bird reproduction. In addition, NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

3.3.3 WS Decision Making. The WS Decision Model[9] is a decision making procedure for evaluating and responding to damage complaints (Figure 3-1). WS personnel are frequently contacted only after requesters have tried non-lethal methods and found them to be inadequate for reducing damage to an acceptable level. WS personnel evaluate the appropriateness of strategies, and methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are developed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results with the damage management strategy.

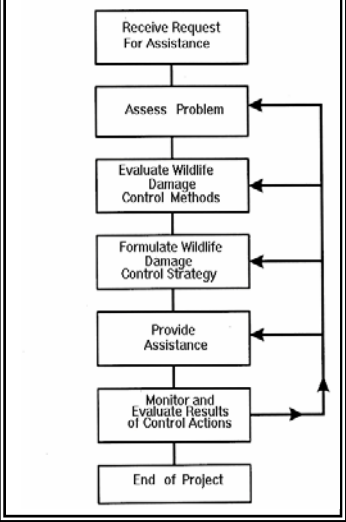
3.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Several alternatives were considered but not analyzed in detail. These are:

[9] The WS Decision Model is not a written process but a mental problem-solving process, common to most if not all professions, to determine appropriate actions to take.

3.4.1 Compensation for Bird Damage Losses: The Compensation Alternative would require the establishment of a system to reimburse persons/businesses impacted by bird damage. This alternative was eliminated from further analysis because no federal or state laws/policies or regulations exist to authorize such payments for bird damage. Under this alternative, WS would not provide any technical assistance or operational bird damage management to requesters. Aside from the lack of legal authority, analysis of this alternative in USDA (1997) indicates it has many drawbacks, some of which are:

Figure 3-1. WS Decision Model.



- It would require larger expenditures of money and labor to investigate and validate all losses and administer appropriate compensation.
- Compensation would most likely be below full market value.
- It would be difficult to make timely responses to all requests.
- Many losses could not be verified; for example, it would be impossible to prove conclusively in some situations that birds were responsible for disease outbreaks.
- Compensation would provide less incentive to limit losses through improved husbandry or cultural practices, or other management strategies.
- Not all entities would rely completely on compensation and lethal damage management would most likely continue as permitted by law.
- Compensation would not be practical for reducing threats to public health and safety.

3.4.2 Short Term Eradication and Long Term Population Suppression: In Iowa, eradication of native bird species is not a desired population management goal of any wildlife management agency. Eradication as a general strategy for reducing bird damage would not be considered in detail because:

- WS and USFWS oppose eradication of any native wildlife species.
- IDNR opposes the eradication of native Iowa wildlife species.
- Eradication is not acceptable to most members of the public.
- Regional or statewide attempts at eradication of any native bird species would be next to impossible under the restrictive methods and in those areas where bird damage management could be used in Iowa.

Suppression would direct efforts toward managed reduction of local populations or groups of birds. In areas where damage could be attributed to localized populations, WS could decide to implement local population suppression, if supported by the WS Decision Model (Slate et al. 1992) and after consulting with the IDNR and/or USFWS. However, with the constraints on bird damage management methods and the relatively small geographic area of the state worked by Iowa WS, widespread population suppression would be difficult to achieve, yet alone maintain.

Problems with the concept of suppression are similar to those described above for eradication. It is not realistic or practical to consider large-scale population suppression as the basis of the WS program in Iowa. Typically, WS activities in the state would be conducted on a very small portion of the sites or areas inhabited or frequented by the targeted species.

3.4.3 Bird Damage Management Should Be Conducted Using Only Non-lethal Methods: The

concept of employing a non-lethal repellent to reduce wildlife depredation arose early in agricultural history and has been pursued vigorously ever since (Rogers 1978). However, a consideration and the measure of success of a non-lethal bird damage management program depends on where target birds relocate because a new site can also be a problem. In addition, most animals adjust and ignore new stimuli, a process called habituation (Bomford and O'Brien 1990). Numerous non-lethal techniques have been used to reduce damage caused by many bird species with most having limited success, being labor intensive, impractical, expensive or not effective in reducing damage (Parkhurst et al. 1987, Dolbeer et al. 1988, Tobin et al. 1988, Bomford 1990, Bomford and O'Brien 1990, Mott and Boyd 1995, Stickley et al. 1995, Andelt and Hopper 1996, Belant et al. 1996, Belant et al. 1998). Some methods, however, had limited success, such as distress calls to repel Black-crowned night herons and starlings and changing management practices when the changes allow the enterprise to remain viable (Spanier 1980, Twedt and Glahn 1982, Bomford and O'Brien 1990). Important points when using frightening strategies include the timing of their application and the choice of devices employed. An aggressive and integrated frightening program is essential (Bomford and O'Brien 1990). Playing animal vocalizations to disperse birds during the night, though, can be annoying to people trying to sleep, and could cause other disturbance to domestic animals and wildlife and people. In addition, using sounds based on animal vocalizations must have a certain degree of expertise and motivation to be successful (Bomford and O'Brien 1990).

Many aversive agents have been tested to condition birds to avoid foods, roosts and nest sites. Despite extensive research, the efficacy of these techniques remains unproven or inconsistent (Bomford and O'Brien 1990). In addition, most reported bird repellents are not currently registered by the EPA or IDALS for this use and, therefore, cannot be legally used or recommended by WS for this purpose.

Limiting bird damage management to only non-lethal methods would not allow for a full range of IWDM techniques to resolve damage management problems. WS is authorized and directed by Congress to protect American agricultural and natural resources, and property. The alternatives selected for detailed analysis in this EA include non-lethal bird damage management methods and it is believed that analysis of only non-lethal methods would not allow WS the ability to address every damage situation in the most effective manner and expediency is required for public health and safety risks.

3.5 STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT TECHNIQUES

SOPs are features of an action that serve to prevent, reduce, or compensate for unwanted effects that otherwise might result from that action. The current WS program, nationwide and in Iowa, uses many such measures, which are discussed in detail in Chapter 5 of USDA (1997). The following measures apply to the alternatives in this EA, as indicated in the columns.

SOPs	**Alternatives**		
	Current Program	Technical Assistance	No WS Program
Animal Welfare and Humaneness of Methods Used by WS			
Research on selectivity and humaneness of management practices would be adopted as appropriate.	X	X	
The WS Decision Model (Slate et al. 1992) would be used to identify effective biological and ecologically sound bird damage management strategies and their impacts.	X	X	

SOPs	Alternatives		
	Current Program	Technical Assistance	No WS Program
Euthanasia procedures approved by the AVMA would be used for live birds.	X		
The use of newly developed, proven non-lethal methods would be encouraged when appropriate.	X	X	
WS would continue to improve the selectivity and humaneness of management devices.	X	X	
Chemical immobilization/euthanasia procedures that do not cause pain would be used.	X		
All live traps would be maintained with food and water.	X		
Safety Concerns Regarding WS Damage Management Methods			
The WS Decision Model (Slate et al. 1992), designed to identify the most appropriate damage management strategies and their impacts, would be used to determine bird damage management strategies.	X	X	
All pesticides used by WS are registered with the EPA and IDALS.	X		
EPA-approved label directions would be followed.	X		
Most avicides and live traps would be primarily restricted to private lands.	X		
Pesticide use would be by trained and certified personnel.	X		
WS employees, who use pesticides, participate in IDALS approved continuing education to keep abreast of developments and maintain their certifications.	X		
Live traps would be placed so that captured animals would not be readily visible from any road or public area.	X		
Avicide use, storage, and disposal conform to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.	X		
Material Safety Data Sheets for avicides are provided to all WS personnel involved with specific bird damage management activities.	X		
Research is being conducted to: 1) improve bird damage management methods and strategies, 2) increase selectivity for target species, 3) develop effective non-lethal methods, and, 4) evaluate non-target hazards and environmental impacts.	X	X	

SOPs	Alternatives		
	Current Program	Technical Assistance	No WS Program
Concerns about Impacts of Damage Management on Target Species, T/E Species, Species of Special Concern, and Non-target Species			
WS and the USFWS determined there would be no effect or a may effect not likely to adversely affect T/E species, and would continue to adhere to all applicable measures to ensure protection of T/E species.	X		
Management actions would be directed toward localized populations or groups and/or individual offending birds.	X		
WS personnel are trained and experienced to select the most appropriate methods for removing targeted birds and excluding non-target species.	X		
WS take of birds would be provided to the USFWS and IDNR for monitoring the potential impacts to bird populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of bird populations (See Chapter 4)	X		
WS consulted with the USFWS regarding the nationwide program and would continue to abide by all applicable measures identified by the USFWS to ensure protection of T/E species.	X	X	
The presence of non-target species is monitored before using avicides at feedlots and dairies to reduce the risk of mortality to non-target species.	X		
If non-target species are present or likely to be present where avicides are being applied, WS would remain on site to discourage non-target visitation, apply such avicides in locations where non-target species would not be encountered or take further actions to mitigate risk.	X		

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 provides information needed for making informed decisions and in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2 and comparison with the proposed action to determine if the real or potential impacts are greater, lesser, or similar.

4.2 ENVIRONMENTAL CONSEQUENCES

The following resource values in Iowa are not expected to be adversely affected by the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, wilderness, and range. These resources will not be analyzed further. In addition, no issues have been identified relative to bird damage management that are inconsistent with EO 12898, 13045, 13112, or 13186 (see Appendix B).

4.2.1 Social and Recreational Concerns: It is not anticipated that the proposed action would result in any adverse cumulative effects to social and recreational resources. Further discussions of WS activities on social and recreational concerns are found in Section 4.3 and USDA (1997).

4.2.2 Wastes (Hazardous and Solid): When bird damage management-treated bait cannot be used or when baits are not totally consumed, the bait is disposed of according to label instructions or directions provided by the IDALS. It is not anticipated that the proposed action would result in any adverse cumulative effects from solid or hazardous wastes.

4.2.3 Target and Non-target Wildlife Species: Cumulative impacts to potentially affected bird species' populations are addressed in detail in Section 4.3.1.

4.2.4 Irreversible and Irretrievable Commitments of Resources: Other than relatively minor uses of fuels for motor vehicles and electricity for office operations, no irreversible or irretrievable commitments of resources result from the Iowa WS program. Based on these estimates, the Iowa WS program has negligible effects on the supply of fossil fuels and electrical energy.

4.2.5 Cumulative and Unavoidable Impacts: Cumulative and unavoidable impacts of each alternative to target and non-target populations are discussed and analyzed in this chapter (Section 4.3.1 and 4.3.2) and effects from this management plan are discussed in relationship to bird species/groups. This EA recognizes that the total annual removal[10] of birds by all causes is the cumulative mortality. Cumulative impacts would be mortality caused by Iowa WS bird damage management and other known causes of mortality (USDA 1997). It is not anticipated that the proposed action would result in any adverse cumulative effects to bird/wildlife populations, including T/E species.

Estimating wildlife densities is not precise and populations and habitats are, as a rule, dynamic; therefore, professional judgment is required to account for unknowns and variables. Some of these variables include the ability of habitats to support populations of animals, the effects of habitat variability on population stability, weather, predation and recruitment. In addition, wildlife

10 It is recognized that the other mortality of wildlife (*i.e.*, road kills, disease, natural mortality, etc.) occurs throughout Iowa but no reliable system exists for recording this information.

populations can change considerably from one year to the next due to factors such as habitat change, drought, food shortages or disease. Therefore, adverse effects assessments are based on conservative estimates and trends to better ensure that no unwanted adverse wildlife population impacts occur.

Analysis of Iowa WS' bird "*take,*" combined with other possible mortality, indicates that cumulative annual impacts would not be significant, and through close cooperation and consultation with the USFWS and IDNR are not expected to adversely affect bird populations. The Iowa WS program is not expected to have any adverse cumulative effects on non-target wildlife or their habitats, including T/E species. Furthermore, bird damage management, as implemented by WS, would not jeopardize public health and safety.

4.2.6 Evaluation of Significance: Each major issue is evaluated under each alternative and the direct, indirect and cumulative impacts were analyzed. NEPA regulations describe the elements that determine whether or not an impact is "*significant*." Significance is dependent upon the context and intensity of the action. The following factors were used to evaluate the significance of WS' actions analyzed in this EA that relate to context and intensity (adapted from USDA 1997).

4.2.6.1 Magnitude of the Impact (size, number, or relative amount of impact) (intensity). Magnitude is defined in USDA (1997) as "*. . . a measure of the number of animals killed in relation to their abundance."* Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, predetermined harvest levels, and actual harvest data. Qualitative analysis is based on population trends and harvest data or trends and modeling. "*Other Harvest"* includes the known sport harvest, and other information obtained from the IDNR and USFWS. "*Total Harvest"* is the sum of the Iowa WS kill combined with the "*Other Harvest*."

4.2.6.2 Duration and Frequency of the Action. Factors affecting bird behavior will affect the duration and frequency of bird damage management activities conducted by WS in Iowa. Bird damage management at airports may be long term projects, but the frequency of individual bird damage management operations may be short, depending upon spatial and temporal factors affecting the behavior of the birds that are causing or potentially causing damage. For instance, the removal of several birds that continue to loaf near runways may be very infrequent if non-lethal techniques prevent additional birds from habituating to the area. Projects are generally short in duration, but may happen frequently at different sites.

4.2.6.3 Likelihood of the Impact. Bird damage management in Iowa has a low magnitude of impact on overall wildlife populations as compared to natural mortality factors that these populations experience. Because all wildlife populations may experience compensatory and additive mortalities year round, the effect of WS bird damage management will generally not result in adverse effects to populations.

4.2.6.4 Geographic Extent. Bird damage management could occur anywhere in Iowa where damage management has been requested, agreements for such actions are in place and action is warranted, as determined by implementing the WS Decision Model (Slate et al. 1992). Actions would generally be limited to areas receiving damage by birds, areas with historical bird damage, or areas where a threat of damage exists.

4.3 ISSUES ANALYZED IN DETAIL

This section analyzes the environmental consequences of the issues analyzed in detail using the current program as the baseline for comparison with the other alternatives to determine if the real or potential

impacts are greater, lesser or the same (Table 4-4). Four key issues of this program have been identified, and each of these issues is analyzed for each alternative. The four issues are:

- Cumulative Effects of WS Bird Damage Management on Target Species' Populations
- Effects of WS Bird Damage Management on Non-target Species Populations, Including T/E Species
- Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets
- Efficacy of WS Bird Damage Management Methods.

4.3.1 Cumulative Effects of WS Bird Damage Management on Target Species' Populations

Analysis of this issue is related primarily to those species most often removed during WS bird damage management, or which could be intentionally dispersed during bird damage management activities. Generally, WS conducts damage management on species whose population densities are high (*e.g.,* overabundant or *anthropogenically abundant* (Conover 2002)) and/or invasive species and only after they have caused damage or an identified damage risk and a request is received. The analysis for magnitude of impact on populations of these species generally follows the process described in USDA (1997 Chapter 4).

WS conducts damage reduction activities involving bird species protected by the MBTA administered by the USFWS. These species are taken in accordance with applicable federal laws and regulations authorizing take of migratory birds, their nests and eggs within the constraints of the USFWS permitting process[11]. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation take as needed to assure cumulative take does not adversely affect the continued viability of specific populations. This should assure that cumulative impacts on species protected under the MBTA would have no significant adverse impact on the quality of the human environment and long-term viability of the population.

The target species were selected because Iowa WS has received requests for assistance with these species and they could be taken or dispersed to protect people from injury or damage (*i.e.,* disease risks or to reduce or prevent risks to the traveling public from bird strikes to aircraft), agricultural and natural resources, and property. In addition, other target bird species, nests and eggs could be trapped and/or relocated under an emergency situation by Iowa WS as provided by WS' MBTA permit #MB753865-0, Section G when birds pose an immediate threat to human health and safety or where the health of the bird is jeopardized.

4.3.1.1 Alternative 1 – Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action)

Alternative 1 would continue the current Iowa WS adaptive bird damage management program. Based on historical information, it is anticipated that the majority of Iowa WS' bird damage management will be at airports where bird damage has occurred or where potential hazards to the traveling public and damage to aircraft and property could occur. Iowa WS also conducts activities to reduce: 1) disease transmission risks to livestock and minimize livestock feed consumption/contamination by birds, and 2) damage at aquaculture facilities caused by piscivorous birds.

As stated earlier, additional agreements may be signed by WS in the foreseeable future to assist

11 It is entirely possible that an urgent need or emergency, such as threats to the traveling public could require that action be taken prior to reaching a decision. None of the planners and decision makers involved in this effort is precluded from considering comments filed in this process at any time (even after actions to deal with the threat have begun) and making appropriate adjustments to ongoing program operations.

landowners/managers with bird damage problems; however, these additional agreements are not anticipated to significantly increase WS adverse affects on bird populations. The majority of bird species targeted by WS are migratory and range from northern to southern latitudes during the year. This analysis focuses on Iowa and regional population data using BBS population trend data (see Section 4.3.1.1.1). The BBS is a national survey that annually gathers data during the nesting season, primarily in June, regarding breeding birds. The survey consists of established routes across the U.S. and Canada. Data from USFWS Region 3 and the BBS Eastern Region are used because the boundaries of these geographical units are ecologically based making conclusions more meaningful in terms of migratory bird trends and movements.

Many bird population trends are best monitored by using data from the BBS[12]. The BBS is a large-scale inventory of North American birds coordinated by the USGS, Patuxent Wildlife Research Center (Sauer et al. 2007). The BBS is a combined set of about 2,700 roadside survey routes covering most of the continental United States and southern Canada. The BBS was started in 1968 in the western US; routes are surveyed in late-May to June by surveyors. The stated primary objective of the BBS has been to generate an estimate of population change for songbirds. Population trends of birds tend to fluctuate, especially locally, as a result of variable annual local habitat and climatic conditions. Trends can be determined using different population equations, and statistically tested to determine if a trend is significant. The significance of a trend's "*change*" is reflected in the calculated *P*-value (probability) for that species.

To use the BBS, though, a few assumptions need to be made:

- All birds within a ¼ mile of the observer are seen at all stops on a BBS route; this assumption is faulty because observers often cannot see a ¼ mile in radius at all stops due to obstructions such as hills, trees, and brush and because some bird species are elusive. Therefore, the birds seen per route would provide a conservative estimate of the population. In Iowa, the detectability of birds would vary based on terrain and cover.

- The chosen survey routes are totally random and are fully representative of Iowa habitats. However, when BBS routes are established, survey rules allow the observers to make stops for surveys based on better quality habitat or convenient parking areas, even though the survey sites are supposed to be spaced a ½ mile apart. Therefore, if survey areas had stops with excellent food availability, such as a landfill site or waterfowl nesting habitat where birds may congregate, the count survey could be biased. This would tend to overestimate the population. However, if these sites were not on a route at all, the population could be underestimated.

- Birds are equally distributed throughout the survey area (*i.e.,* Iowa, BBS Western Region or USFWS Region 6) and routes were randomly selected. Routes are not randomly picked throughout the state or areas, but are placed on the nearest available road. The starting point is picked for accessibility by vehicle. Some birds tend to congregate along roadsides and others avoid roadside areas. However, most BBS routes are selected because they are "off the beaten path" so the observer can hear birds without interruption from vehicular noise.

WS, USFWS and IDNR recognize the statistical variability of the data and believe that the BBS represents the best available commercial and scientific data available to evaluate bird populations and population trends. Trend data reported for all species below reflect apparent trends in reported data. WS has not independently evaluated statistical significance in trend data. Because

12 Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty.

bird damage management is generally directed at individual birds or local populations of overabundant/ anthropogenic abundant (Conover 2002) species, the statistical significance of population trends over a large area are only marginally related to local populations where bird damage management occurs.

Non-lethal Damage Management Activities

Preference is given to non-lethal damage management when practical and effective (WS Directive 2.101). Iowa WS dispersed about 180,000 from FY04 through FY06 using non-chemical harassment methods such as propane exploders and pyrotechnics to protect resources. One advantage of dispersing birds is that no cumulative impacts occur. However, there is the possibility that the birds could return to the damage site and inflict additional damage or move to another site and continue to cause damage. Normally large scale relocation activities are limited to wild birds in and around airports and urban areas. Live capture and relocation is not normally practical for smaller birds because of: 1) the number of birds WS confronts, 2) potential public safety and health issues (*i.e.,* capturing birds at an airport where they were involved with aircraft hazards and relocating those birds to another area where they could return to the airport or another site and continue to be a hazard), 3) competition for food resources and other limiting factors with other birds and wildlife, 4) the difficulty in finding acceptable release sites, 5) costs of relocation would increase because of the great distance it requires to relocate birds if trying to prevent them from returning to the original site, and 6) relocated birds could create the same threat to people or livestock in the relocation area.

Lethal Damage Management Activities

Lethal damage management is implemented when a bird damage management problem cannot be resolved effectively through non-lethal damage management techniques or when used to reinforce hazing techniques and where *Agreements for Control* or other comparable documents provide for operational damage management. Table 4-1 provides information on the number of birds Iowa WS killed during operational activities in FY04, FY05 and FY06.

Table 4-1. Target Birds Killed by WS during FY 04 through 06.

FY	Species	Number
04	American crow	9
	American kestrel	2
	Barn swallow	6
	Canada goose	10
	Killdeer	1
	Mallard	5
	Mourning dove	9
05	American crow	8
	Canada goose	14
	Killdeer	2
	Mallard	5
	Mourning dove	24
	Red-winged blackbird	10
06	American crow	61
	Canada goose	10
	Killdeer	3
	Mallard	4
	Mixed blackbirds	279
	Red-winged blackbird	25
	Turkey vulture	1

USFWS Depredation Permits

DPs are necessary under the MBTA for activities related to migratory bird damage management. DPs are not necessary for non-lethal harassment of species protected only under MBTA, but a Section 7 consultation and permit could be required for WS to conduct damage management on migratory birds listed under the ESA. Additionally, any *"take"* of a T/E listed species (which could be protected under MBTA, BGEPA and the ESA) could require multiple permits.

The USFWS has authority for managing migratory birds and issuance of DPs (50 CFR 21.41).

WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds when funding allows, as specified in an MOU with the USFWS. In cases where intermittent damage is occurring and it is not feasible or practical for WS to provide operational assistance, WS could recommend to the USFWS the issuance of a DP to the resource owner (WS Directive 2.301). Table 1-1 provides information on the number of requests for assistance WS received in FY 04, 05 and 06 for bird damage management, the number of DPs WS recommended and forwarded to the USFWS, and the number of DPs issued by the USFWS; Table 4-2 provides take under those permits.

Table 4-2. Birds Killed in Iowa by WS and Other Permittees Under DPs* Issued by the USFWS FY04, 05 and 06

Species	
American crow[1]	78
American kestrel	0
Barn swallow	6
Brown-headed cowbird	50
Canada goose[1]	24
Common grackle	4
Common nighthawk	0
Eastern meadowlark	0
Great blue heron[1]	0
Great horned owl[1]	0
Killdeer	5
Mallard[2]	9
Mourning dove	42
Red-tailed hawk	0
Red-winged blackbird	41
Ring-billed gull	0
Turkey vulture	1

[1] Work will not be conducted on this species until USFWS reauthorizes take under Iowa WS' migratory bird DP.
[2] A case-by-case determination will be made concerning the status of mallards for each damage situation (i.e., domestic or wild birds).

WS conducted a BA to analyze and ensure that WS' activities have no effect on T/E species in Iowa. Guidelines for issuance of permits have been developed and implemented by the USFWS. WS and the USFWS believe the analysis contained in this EA will address the environmental consequences of the USFWS issuing DPs and WS receiving and implementing issued permits.

It should be noted that blackbird, grackle, crow and magpie populations are healthy enough, and the problems they cause great enough, that the USFWS has established a "standing depredation order" (50 CFR 21.43) for use by the public. Under the "standing depredation order" (50 CFR 21.43) no federal permit is required by anyone to remove these birds if they *are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, aquaculture, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*. Additionally, under CI (§456A.24(8)) the state of Iowa has determined that a state permit is not required of any person to shoot or trap blackbirds (Brewer's, Red-winged, Rusty and Yellow-headed blackbirds), cowbirds, crows, grackles and magpies when found committing or about to commit depredations upon agricultural crops, livestock, ornamental or shade trees or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance.

4.3.1.1.1 WS, at Times, Conducts Lethal Bird Damage Management on the Species Below.

American Crow Biology and Population Impacts

American crows are distributed north to south from the Yukon Territory, Canada, to Baja, California and the Gulf of Mexico, and are found from the west coast to the east coast (Johnston 1961). American crows can be found throughout the year in Iowa. From their spring nesting colonies, or autumn and winter roosts, they forage for insects, grain, and carrion. Johnston (1961) reports that crows reach their peak abundance in agricultural areas where there are wooded areas, and have increased in numbers where agricultural practices have intensified.

According to the BBS population trend results, crow populations in Iowa are relatively stable and slightly increased in USFWS Region 3 and the Eastern BBS Region from 1966 to 2005 (Sauer et al. 2007). In addition, crow populations are healthy enough, and the problems they cause great enough, that the USFWS has established a standing depredation order for use by the public.

Under this "order" (50 CFR 21.43), no federal permit is required by anyone to remove crows if they are *committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*.

Iowa WS received two requests for assistance with crow damage in FY04, FY05, and FY06 to protect resources. WS killed nine in FY04, eight in FY05, and 61 in FY06 to reduce damages or potential damages. If damage continues, or if crows at airport facilities present a threat to the traveling public or aircraft from aircraft strikes, WS could remove up to 250 crows (under CFR 21.43) or disperse several hundred more crows without adversely affecting crow populations. Because of USFWS oversight, population and BBS population trend information, WS activities would result in a low magnitude of impact to crow populations in Iowa, USFWS Region 3 or the Eastern BBS Region.

Turkey Vulture Biology and Population Impacts

This species breeds from Canada to southern South America, adapting equally well to deserts, forests, and tropical lowlands (Wilbur 1983). Adult Turkey vultures are black in color with a bright-red, naked head (Robbins et al. 1997), while immature vultures have black heads. Turkey vultures migrate to Iowa in spring, nest, and return to their winter range in the fall. Turkey vultures nest in caves, hollow trees, thickets, or old buildings (Jackson 1983, Ritter 1983). Usually two eggs are laid during nesting but as many as four eggs have been documented (Jackson 1983).

Turkey vultures are carrion feeders, eating fresh meat or carrion in advanced stages of decay, and will readily feed on mammal and bird carcasses of various sizes but may also attack and kill vulnerable livestock. In search of food, vultures soar in circle-type patterns. When food is located by a single bird, other birds are quickly attracted to the site by behavioral cues exhibited by the feeding bird. Local vulture populations have been known to increase and decline (Wilbur 1983), which suggests that food availability could be a limiting factor. A major range expansion into the northeastern United States began after 1920, possibly caused by a decline in bison carrion in the west and an increase of White-tailed deer populations and other road-killed animals.

The BBS population trend data from 1966 to 2005 indicates that the Turkey vulture breeding populations have increased in Iowa, USFWS Region 3 and in the BBS Eastern Region (Sauer et al. 2007). Iowa WS received 3 requests for assistance with Turkey vulture damage in FY04, FY05, and FY06 to protect resources. WS killed one Turkey vulture in FY06 for protection of human health and safety at an airport. WS did recommend one DP be renewed by the USFWS for Turkey vulture damage problems in FY06. Since Turkey vulture population trends appear to be increasing in Iowa, in USFWS Region 3 and in the BBS Eastern Region, WS could take up to 25 Turkey vultures per year under a DP issued by the USFWS to protect human health and safety, property and agricultural resources without adversely affecting populations. Based upon the low level of anticipated take and the increasing Turkey vulture population, WS activities would have a low magnitude of impact and no cumulative impact on Turkey vulture populations.

Canada goose Biology and Population Impacts

The challenges facing wildlife managers are primarily problems associated with goose concentrations, non-migratory geese (*i.e.*, resident Canada geese) and harvest regulation (USFWS 2005). Major management issues are short-stopping, crop and other property damages, and management of growing re-established resident flocks in rural and urban areas. Because geese pass on the migratory routes to their young, those that find safe stops, such as parks, golf courses,

etc., have better survival and increasingly use these areas with each successive year. Programs to displace birds, such as reducing refuge foods and open water and by harassment, have met with limited success. Concurrently, re-established large populations of geese continue to increase at rates of up to 200% every 3 years (USFWS 2005). When these individuals damage crops, turf, gardens, contaminate water/beaches, etc., or endanger human life at airports, intensive management programs are needed.

The Canada goose is the most familiar and common goose in Canada and the United States. This species is found across North America in lakes, bays, rivers and marshes. Canada geese are often seen feeding in open grasslands and stubble fields and become a semi-domesticated bird in city parks, golf courses and on reservoirs. They are chiefly grazers, feeding on turf and marsh vegetation as well as stubble in agricultural fields. Canada geese select open, grassy shorelines where visibility is good, food is abundant, and predator escape cover (open water) is close.

A Canada goose clutch usually contains 5-6 eggs, which hatch within a 24-hour period, starting on or about the 26th day after the last egg is laid. Canada goose nest success typically ranges from 60% to 80%.

From FY 04 through FY06, WS kill 34 resident Canada geese to reduce damage or potential damage to human health and safety at airports in Iowa. WS also provided five incidents of technical assistance in FY04, FY05, and FY06 for damage reduction. The BBS trend data (Sauer et al. 2007) indicate that breeding Canada geese populations have sharply increased in Iowa and in USFWS Region 3 and the BBS Eastern Region. As a result, under a DP issued by the USFWS, WS may remove up to 100 damaging Canada geese and this effect would result in a low magnitude of impact and no cumulative impact on Canada goose populations.

Mallard Biology and Population Impacts

The mallard is the world's most familiar duck (Gooders and Boyer 1986) and is the most adaptable, occupying a wide range of habitats. Clutch sizes vary from 10-12 eggs and incubation takes about 28 days. One of the Mallard's foraging characteristics is its ability to utilize agricultural grain crops as well as natural aquatic foods (Johnsgard 1975).

Duck production depends upon water conditions: when water is abundant, production is good; when water is scarce, production is poor. Other factors that may influence Mallard population trends include predation, limited nesting habitat, liberal hunting regulations, and harvest of females. BBS population trend data from 1966 to 2005 show that breeding populations of Mallards are stable to increasing in Iowa, stable in the Eastern BBS Region and increasing in USFWS Region 3 (Sauer et al. 2007).

Iowa WS killed 14 Mallards from FY04 through FY06 to protect human health and safety at airports in Iowa. The USFWS issued DPs which resulted in the removal of 17 Mallards in FY 04, FY 05, and 2006. If WS received a request to conduct lethal damage management of Mallards or any other wild waterfowl, WS would consult with USFWS and IDNR and conduct activities under a permit. This consultation process, coupled with the fact that Mallard breeding populations appear to be healthy, assures that WS activities have resulted in a low magnitude of impact and have low impacts on hunting opportunities.

Blackbird Biology and Population Impacts

Precise counts of starlings and blackbirds do not exist, but one estimate placed the Unites States

summer population at more than one billion (USDA 1997) and the winter population at 500 million birds (Royall 1977). Meanley and Royall (1976) estimated 538 million blackbirds and starlings in winter roosts across the country during the winter of 1974-75. Of this total, about 74% or about 400 million were in the eastern United States (Meanly and Royall 1976).

WS kill 314 blackbirds in Iowa from FY04 through FY06 to protect human health and safety at airports in Iowa, of which 35 were Red-winged blackbirds and 279 were in mixed blackbird flocks. Red-winged blackbird population trends from 1966 to 2005 show that populations are relatively stable to decreasing in Iowa, in USFWS Region 3 and the Eastern BBS Region (Sauer et al. 2007). Trend data for Brown-headed cowbirds indicate that populations are relatively stable in Iowa, and relatively stable to decreasing in USFWS Region 3 and the BBS Eastern Region (Sauer et al. 2007). Trend data for Common grackles show a relatively stable population in Iowa, in USFWS Region 3and the BBS Eastern Region (Sauer et al. 2007). Because of the possibility that Iowa WS could potentially take up to 10,000 of each of these species to protect resources, based on this information, WS has determined that bird damage management would have no cumulative impacts on populations of these blackbirds based on BBS population trends as described by Sauer et al. (2007), and the reproductive potential and natural mortality of these species (see Section 2.4.7). Therefore, removal of damaging blackbirds would have a low magnitude of impact on populations of these species. Additionally, the size of blackbird populations, coupled with the scope of the problems blackbirds cause, led the USFWS to establish a standing depredation order. Under this "Order" (50 CFR 21.43), no federal permit is required by anyone to remove blackbirds if they *are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*. All of the above information indicates that populations of blackbirds are healthy and viable in Iowa, USFWS Region 3, and the BBS Eastern Region and nationwide.

Barn Swallow Biology and Population Impacts.

Barn swallows are common near farms, bridges and other buildings, where they build mud nests on building rafters, bridges, or other vertical structures. There are several subspecies of the Barn swallow breeding across the Northern Hemisphere and wintering further south; its huge range means the Barn swallow can be found in many places. The Barn swallow is the most abundant and widely distributed swallow species in the world. It breeds throughout the northern hemisphere and winters in much of the southern hemisphere. The Barn swallow is a bird of open country which usually uses man-made structures to breed, and consequently has spread with human expansion. Artificial structures have allowed it to move into new areas and nest in higher densities than ever before. As a result, populations are much greater than they were before European settlement of North America. BBS data indicate that barn swallow population trends in Iowa are relatively stable and relatively stable in the USFWS Region 3 (Sauer et al. 2007).

During FY 04 through 06, WS killed six swallows, and responded four requests for assistance to protect property and human health and safety (*i.e*., aviation) and the USFWS issues four DPs for problems in Iowa from FY04 through FY06 (Table 1-1). Since swallow population trends appear to be relatively stable in Iowa and USFWS Region 3, WS could remove under a DP issued by the USFWS up to 50 barn swallows per year without adversely affecting populations. These activities will have a low magnitude of impact on barn populations.

American Kestrel Biology and Population Impacts.

American kestrels are the smallest and most common falcon in open and semi-open country, which frequently use telephone poles or wires as hunting perches and are often mistaken for a

songbird. Estimates of up to 1.2 million breeding pairs have been made for the North American population (Cade et al. 1988), with an equal number thought to breed in the neotropics. Their breeding range extends as far north as central and western Alaska across northern Canada to Nova Scotia, and extends south throughout North America, into central Mexico, the Baja, and the Caribbean. They are local breeders in Central America and are widely distributed throughout South America. Most of the birds breeding in Canada and the northern United States migrate south in the winter, although some males stay as year round residents.

Kestrels consume primarily insects in the summer; however, they will also eat small rodents and birds. Wintering birds feed primarily on rodents and birds. It is possible that the use of pesticides has had an effect on them in recent decades. An even greater problem may be a scarcity of nest sites. Being a secondary cavity nester, the kestrel requires an abandoned woodpecker hole or similar cavity to nest and must often compete with starlings, an aggressive, invasive, secondary cavity nester.

BBS population trends indicate that kestrel population trends are stable to increasing in Iowa, in USFWS Region 3 and the Eastern BBS Region (Sauer et al. 2007). During FY 04 through 06, WS killed two kestrels (Table 4-1) and received two requests for assistance from FY04 through FY06 for human health and safety (*i.e.,* aviation). WS also recommend the issuance of one DP to the USFWS in FY06. Because kestrel populations appear healthy, are stable to increasing in Iowa, in USFWS Region 3 and the Eastern BBS Region, removal of up to 20 kestrels causing damage or potentially causing damage annually (*i.e.,* bird aircraft strikes) by WS would result in a low magnitude of impact.

Mourning Dove Biology and Population Impacts

Mourning doves are migratory bird with substantial populations throughout much of North America and are the commonest native dove found in suburban and farmland areas and is the most widely hunted and harvested game bird. This dove, found across the United States and southern Canada, is most common throughout the Great Plains in the Midwest. Mourning doves are one of Iowa's most widespread breeding bird species. They can be found on telephone wires and trees in most neighborhoods in the southern half of the state and in conifer plantations between late March and late September or early October. They are capable of multiple brooding in its range, and their range is expanding northward (Ehrlich et al. 1988). After its prolonged breeding season, most congregate in large flocks particularly around agricultural fields (Walsh et al. 1999). They are seed eating birds and many states have regulated annual hunting seasons for this species.

WS disperse 300 Mourning doves during FY 04 through FY 06, and killed 42 Mourning doves at airport facilities in FY 04 through FY 06 to reduce the risk of bird/aircraft strikes (Table 4-1). Mourning doves are considered a game species with a regulated hunting season[13] with reported take of more than 22,000,000 in 2005-2006 in nationwide http://www.fws.gov/migratorybirds/reports/status06/Mourning%20Dove%20Population%20Status,%202006%20report.pdf. Mourning dove breeding populations appear to be high and stable in Iowa and stable to increasing in USFWS Region 3 and in the BBS Eastern Region. Based on an anticipated increase in requests for services, WS' lethal management of Mourning doves in Iowa could be expected to remove up to 250 damaging or potentially damaging birds in any one year under the current/proposed program. However, WS activities would result in a low magnitude of

13 Iowa does not have a hunting season for mourning doves and thus no take data is available for Iowa.

impact based on reported hunter harvest and have low impacts to hunting opportunities.

Killdeer Biology and Population Impacts

The Killdeer is a medium sized plover with brown upper feathers and white undersides. It has a brown head with a black band between its eyes, white "eyebrows" and black bands around its upper chest. Males and females look alike. They are migratory in northern areas and winter as far south as northern South America and winter north to British Columbia, Utah, the Ohio Valley and Massachusetts. It also can be found in Central and South America.

The Killdeer can be found in open grasslands, wetlands, fields, croplands and pastures, and short-grass prairies. They are often found on sandbars, mudflats and pastures. They breed in open fields or lawns, often quite far from water, across most of Canada, the United States, and Mexico, with isolated populations in Costa Rica and Peru. They nest on the ground in an open area with a clear line of sight, or possible on a gravel roof. Once Killdeer have mated, the pair will scrape out a nesting site and the female lays an average of four eggs with both the male and the female incubate the eggs. The eggs generally hatch in 24-28 days. Once the chicks' down dries, the parents lead them to a feeding area, but stay with their parents until they fledge in about a month after birth. Killdeer may have two broods a year. The Killdeer sometimes distracts predators from its nest by pretending to be injured by dragging itself and dragging its wings like they are broken along the ground, sometimes on one foot. When the predator turns it attention to the Killdeer and away from the nest, the adult Killdeer flies away.

Iowa WS received 15 requests for assistance with Killdeer damage in FY04, FY05, and FY 06 to protect resources and human health and safety at airports in Iowa. WS killed five Killdeer in FY04, though FY 06 at airports to protect property and human health and safety (Table 4-1). WS recommended 15 DPs be renewed by the USFWS for Killdeer damage problems in FY04 through FY 06; the USFWS renewed 15 DPs in 2005 and 2006. Since Killdeer population trends appear to be increasing in Iowa and in USFWS Region 3 and stable in the Eastern BBS area (Sauer et al. 2007), WS could take up to 100 Killdeer per year under a DP issued by the USFWS to protect human health and safety and property without adversely affecting populations. Based upon the low level of anticipated take and an increasing Killdeer population, WS activities would have a low magnitude of impact and no cumulative impact on Killdeer populations.

4.3.1.1.2 WS Did Not Conduct Lethal Bird Damage Management on the Species Below, but did Provide Technical Assistance or Non-lethal Operational Bird Damage Management.

Even though WS did not provide any lethal bird damage management to reduce damage from the species listed below, occasions could arise whereby lethal bird damage management would be required to reduce damages to acceptable levels or reduce health and safety risks or threats. Lethal management would be coordinated through permits issued by the USFWS for species protected under the MBTA before actions would be taken.

Ring-billed Gull Biology and Population Impacts

During most of the last several decades, several gull species (*i.e.*, Ring-billed, Herring (*Larus argentatus*), and California gulls (*L. californicus*) have expanded their range and increased their populations substantially. In addition to increases in gull populations in natural habitats, there has been an increase in populations in urban areas, where gulls have established colonies on buildings (Dolbeer et al. 1990).

Ring-billed gulls are similar in appearance to California and Herring gulls but smaller, with

yellow feet, a yellow bill and a black band near the tip. Ring-billed gulls are a common gull and populations are concentrated near lakes, reservoirs, and other large bodies of water. Like most gulls, Ring-billed gulls are omnivorous, feeding on animal and plant matter. Common feeding sites are open refuse dumps, livestock feedlots, fish hatcheries, open fields and food processing plants. Spring arrival of migrants in Iowa begins in March/April and autumn migration is normally completed in October; however, some Ring-billed gulls may remain longer.

WS responded to 20 requests for assistance between FY04 and FY06 to reduce gull damage. After investigating complaints, WS recommended that the USFWS issue or renew 20 DP between 2004 and 2006 the USFWS renewed 20 DP (Table 1-1). In addition, the USFWS reported that no gulls of any species were killed under DPs in 2004, 2005, and 2006 respectively (Table 4-2).

BBS population trend data indicate that Ring-billed gulls in USFWS Region 3 and BBS Eastern Region have increased (Sauer et al. 2007). Because Ring-billed gull population trend data indicate that populations are increasing, WS could remove up to 10 damaging or potentially damaging Ring-billed gulls without adversely affecting populations. Based on the above information, with USFWS oversight, this level of take by WS in Iowa would have a low magnitude of impact and no cumulative impact on local, statewide, or regional Ring-billed gull populations.

Red-tailed Hawk Biology and Population Impacts

Red-tailed hawks are a well-known and common buteo. They range throughout North America to central Alaska and northern Canada, and south as far as Panama. Although not truly migratory, they do adjust seasonally to areas with abundant prey. In winter many of the northern birds move south. They nest in woodlands and feed on rodents and rabbits in open country. The uniformly colored tails of the adult and dark belly band are the best field marks. They often perch on poles or treetops to hunt. The Red-tailed hawk is the largest hawk, usually weighing between 2 and 4 pounds. As with most raptors, the female is nearly $^{1}/_{3}$ larger than the male and may have a wing span of 56 inches. This species shows a great deal of individual variation in plumage.

Mating and nest building begin in early spring, usually in March and continue through May. This is accompanied by spectacular aerial displays by both males and females. Circling and soaring to great heights, they fold their wings and plummet to treetop level, repeating this display as much as five or six times. Nests are located from 35 to 75 feet high in the forks of large trees. Nest sites may be used from year to year, since there is strong evidence that hawks mate for life. The female usually lays two eggs which are incubated for 28-32 days. When the eggs hatch, the young are covered with white down and grow slowly, requiring much food, which keeps both parents busy. They remain in the nest for up to 48 days.

BBS population trends indicate that Red-tailed hawk populations have steadily increased in Iowa, in USFWS Region 3 and in the Eastern BBS Region (Sauer et al. 2007). During FY 04 through 06, WS did not kill any Red-tailed hawks (Table 4-1). However, WS did receive three requests for assistance in FY04 through FY06 for damage management assistance to protect human health and safety and poultry. WS also recommended the issuance of two DPs to the USFWS in FY05. Because Red-tailed hawk populations appear healthy, and are increasing in Iowa, in USFWS Region 3 and in the BBS Eastern region, removal of up to 25 Red-tailed hawks causing damage or potentially causing damage (*i.e.,* bird aircraft strikes) annually by WS would result in a low magnitude of impact.

Great Horned Owl Biology and Population Impacts

The Great horned owl is common in Iowa and throughout the United States and the largest owl in North America. They are found throughout North America from the northern treeline into Central and South America. They are primarily nonmigratory; however, birds living in the northern part of the range of this species may migrate south.

The Great horned owl's color pattern is similar to that of the long-eared owl (*Asio otus*); however, great horned owl "*ear tufts*" are larger and farther apart; their bellies are finely barred horizontally. They are found in woods, mountain forests, desert canyons, marshes, city parks, and urban forests. The owls prefer open areas to dense woodlands and typically nest close to the forest edges where they hunt. Activity generally begins at dusk, but in some regions, great horned owls may be seen in late afternoon or early morning. They hunt by perching on snags and poles and watching for prey, or by gliding slowly above the ground. A Great horned owl may take prey 2 to 3-times heavier than itself. They also hunt by walking on the ground to capture small prey or by wading into water. They have been known to walk into chicken coops to take domestic fowl. An extremely wide range of prey species (at least 253 identified) are captured, but rabbits and hares are its preferred prey. Great horned owls commonly occupy the abandoned nests of large birds, but will also nest in tree cavities, stumps, caves or on rocky ledges.

Great horned owls are one of the earliest spring nesting birds; eggs may be laid from February through April. They lay from one to three eggs but typically two eggs are laid. The young fledge from the nest at 45-55 days of age. They are extremely aggressive when defending the nest and will continue to attack until the intruder is killed or driven off. They are a long-lived owl; captive birds have been known to live 29 to 38 years, and wild owls up to 13 years.

From FY04 through FY06, no great horned owls were killed by WS to protect resources (Table 4-2) but WS receiving two requests for assistance for Great horned owl damage management. In addition, the USFWS issued two DPS but permit holders did not removed any Great horned owls in Iowa from 2004 through 2006 respectively (Table 4-2).

BBS population trends for Iowa and USFWS Region 3 indicate that Great horned owl populations are stable (Sauer et al. 2007). Because Great horned owl populations appear to be healthy and relatively stable in Iowa and USFWS Region 3, annual removal of up to 25 damage-causing Great horned owls by WS under a DP issued by the USFWS would result in a low magnitude of impact and no cumulative impact on populations.

Great Blue Heron Biology and Population Impacts

One of the tallest birds in Iowa, the Great blue heron stands about 38 inches tall and has a wing span of about 70 inches (Robbins et al. 1997). Great blue herons are the most widely distributed herons in the United States and are commonly seen in Iowa during the spring, summer, and autumn. Herons feed on fish and other aquatic vertebrates and are commonly viewed standing or wading on the shores of ponds, creeks, and rivers. The head of the heron is largely white with dark underparts and the body is primarily bluish in color.

Great blue herons nest in close proximity in colonies called rookeries in swampy areas but will occasionally nest singly. Their nests are usually in the tops of tall trees. Adults begin to gather at colony sites in March. They build large platform nests of plant stems and twigs, often lined with small twigs or grasses. The female lays three to five pale bluish-green eggs.

Loss of nesting habitat and degradation of wetland foraging areas are the greatest threats to great blue herons. However, BBS population trend data for Iowa and USFWS Region 3 indicate Great blue herons are increasing and in the BBS Eastern Region relatively stable (Sauer et al. 2007).

From FY04 through FY06, WS did not kill any Great blue herons (Table 4-1) but provided technical assistance with 15 incidents of Great blue heron damage and recommended that 15 DPs be issued by the USFWS (Table 1-1). No Great blue herons killed were killed under DPs issued by the USFWS from 2004 through 2006 respectively (Table 4-2). Because Great blue heron populations appear to be increasing in Iowa and USFWS Region 3, and stable in the Eastern BBS Region, removal of up to 20 damaging herons under permits issued by the USFWS would result in a low magnitude of impact and no cumulative impact on local, statewide, or regional Great blue heron populations.

Eastern Meadowlark Biology and Population Impacts

This bird is not a lark at all but a relative of the blackbirds and orioles. It ranges from southeastern Canada, eastern United States and southwestern United States. It has thrived as more land was farmed, for the Eastern meadowlarks are birds of meadows and grain fields. Meadowlarks feed and nest in native grasslands, pastures, and savannas, hay and alfalfa fields, roadsides, golf courses, and shrubby overgrown fields. They may winter in old fields and salt marshes.

Eastern meadowlarks feed largely on insects, especially crickets and grasshoppers, as well as caterpillars; weed seeds, grains, and other vegetable matter comprises roughly a quarter of their diet, varying with season and availability.

Their nests are built on the ground, in areas of dense cover, in a small depression in the soil. The nest usually has narrow runways and trails leading from the nest through grass. The female lays two clutches of between 3and 5 eggs annually with incubation lasting about 13-15 days. Both parents feed nestlings, but the female does more. The young leave the nest after about 11-12 days, when still unable to fly, and are attended by the parents for at least 2 more weeks.

From FY04 through FY06, WS did not kill any meadowlarks (Table 4-1). One incident of meadowlark damage was reported to WS between FY04 and FY06 and upon investigation, WS recommended five DPs be issued by the USFWS in 2004 through 2006 and the USFWS renewed five DPs. No meadowlarks were killed under DPs issued by the USFWS from 2004 through 2006 (Table 4-2). Meadowlark populations have been declining in Iowa, in USFWS Region 3 and in the BBS Eastern Region (Sauer et al. 2007). WS has not killed any meadowlarks, however if they occurred on an airport and could potentially cause risks to human health and safety, the removal of up to 50 meadowlarks annually by WS, would result in a low magnitude of impact and no cumulative impact to the species.

Bald Eagle Biology and Population Impacts.

Bald eagles are unnoticeably smaller in body size and weight than Golden eagles, but have a slightly wider wing span. Mature Bald eagles have a distinct white head and tail and legs are unfeathered. They have a much heavier bill than golden eagles. Immature Bald eagles are easily mistaken for Golden eagles since the two species' coloration is similar. Bald eagles are normally found in Iowa near large bodies of water, rivers and creeks, and marshes. Food habits of Bald eagles are varied and they partake in scavenging more often than hunt for live prey. It is not uncommon to find Bald eagles feeding on livestock carcasses or carcasses of deer and other large animals killed near highways.

The Bald eagle is provided federal protection through the MBTA and BGEPA which prohibits, except under certain specified conditions, the taking, possession, and commerce of such birds, and assesses penalties for violations of the MBTA and BGEPA.

A total of 200 eagle nest territories were occupied by breeding adults in Iowa in 2006; this is an increase of 116 pairs from 2000. The number of young produced in 2006 was sufficient to support Iowa statewide eagle population to continue its overall growth. In addition, Iowa and USFWS Region 3 BBS data indicate that populations are increasing (Sauer et al. 2007). Base on population increases and range expansion, the Bald eagle is proposed for delisting from protection of the ESA.

Iowa WS did not respond to any requests for assistance during FY 04 through FY06 concerning eagle damage. If operational assistance is necessary, WS would initiate consultation with the USFWS and non-lethal methods would be employed, if deemed appropriate. However, the 1992 USFWS BO stipulates that WS is allowed the incidental take of two Bald eagles nationwide per year, with the exception of the Southwestern population. The BO references that the USFWS has determined that this level of take is not likely to result in jeopardy to the species, thus, having no cumulative impacts to Bald eagles.

Feral, Domestic and Exotic Bird Biology and Population Impacts

WS is requested to provide bird damage management for losses or nuisances created by feral, free-ranging, domestic, non-indigenous, and exotic birds (WS Directive 2.320). The terms "feral" and "free-ranging" relate to domestic animals which have permanently escaped confinement or have been released into the wild, rural areas, city parks, etc. Feral and free-ranging birds are not necessarily dependent upon people for food or care. A domestic duck, commonly found on farms and urban lakes and ponds, is a product of the domestication of the mallard, a larger bird than generally found in truly wild populations. Examples of other domestic or domestic hybrid birds include Muscovy ducks, Pea fowl, Golden pheasants, Monk parakeets, etc. "Domestic" refers to birds such as chickens, turkeys, guinea fowl, racing pigeons, domestic ducks and geese, Ostriches, Emus, etc. that have escaped (or have been released) temporarily from their confinements or owners but are still totally dependent on people for food and care. "Exotic" and "non-indigenous" refer to birds not native to Iowa which have been illegally or accidentally introduced or released into the wild.

Birds classified or termed feral, free-ranging, domestic, and exotic are not considered wildlife and are not afforded lawful protection or managed by the USFWS or IDNR. Therefore, trend data do not typically exist for these species.

In Iowa, WS uses a combination of methods to distinguish feral ducks (unprotected) from wild ducks (protected under MBTA). Feral ducks are distinguished by feather coloration not typical of wild ducks (*i.e.,* all white, a combination of white and other colors in a random pattern (*i.e.,* mottled) or very dark plumage on hens), weight (ducks in excess of 3¾ lbs (1.7 kg) during most of the year or 4½ lbs (2.0 kg) from November through January are considered feral) and/or flight ability (*i.e.*, many domestic ducks cannot fly or fly very poorly). Flight ability alone is not used as a determining factor, especially during the summer molt. Most feral ducks exhibit two or more of these characteristics.

Where practical, WS will use non-lethal methods to solve problems caused by feral, domestic and exotic birds, including adoption of captured birds by the public when appropriate. Any lethal bird damage management by WS would be on a site-specific basis. In those cases where birds are

causing damage or are a nuisance, complete removal of the local population is desirable. This would be considered beneficial to the human environment, since it would be requested by the affected property owner, administrator, or resource management agency.

From FY02 through FY06, WS did not capture nor kill any exotic or feral birds (except for feral pigeons) in Iowa; however, because of the status of these birds, lethal removal would not be considered to have an adverse effect on native species.

Other Target Species

Target species, in addition to the bird species analyzed above, could be killed or have nests removed in small numbers by WS during damage management activities. Most of these birds are protected by the USFWS under the MBTA and the take is limited by permit. Therefore, these birds are taken into account with applicable state and federal laws and regulations authorizing take of migratory birds and their nest and eggs on a case-by-case basis. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on populations of this species would have no significant adverse impact on the quality of the human environment.

Based upon an anticipated increase in future requests for WS assistance, WS predicts that no more than 10 individuals and no more than 10 nests of other target species would be removed annually. None of the "other target species" are expected to be taken by Iowa WS at any level that would adversely affect overall bird populations and consequently, would have a low magnitude of impact.

4.3.1.2 Alternative 2 - Technical Assistance Only

Under this alternative, WS would have no adverse effect on target species populations directly. Private efforts to reduce or prevent damage and perceived disease transmission risks to humans and livestock could increase, resulting in increased potential impacts on those bird populations and humans. For the same reasons shown in Section 4.3.1.1, it is unlikely that populations of target species would be adversely affected by implementation of this alternative. Impacts and hypothetical risks of illegal toxicant use would be greater under this alternative than Alternative 1. AC is currently only available for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce losses would lead to illegal use of toxicants by others, which could increase adverse effects to an unknown level.

4.3.1.3 Alternative 3 - No WS Bird Damage Management

Under this alternative, WS would not have any impact on populations of target species in the state or region. Private efforts to reduce or prevent depredations would increase, which could result in varying degrees of impacts to populations of target species. Impacts to target species under this alternative could be the same, less, or more than those of the current or proposed program, depending on the level of effort expended. For the same reasons shown in the population impacts analysis in Section 4.3.1.1, it is unlikely that target species populations would be adversely affected by implementation of this alternative. AC is currently available for use only by WS employees. It is hypothetically possible that frustration caused by the inability to reduce losses would lead to illegal use of toxicants by others which could increase impacts to an unknown level.

4.3.2 Effects of WS Bird Damage Management on Non-target Species Populations Including

T/E Species

4.3.2.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action)

Adverse Effects on Non-target (non-T/E) Species. Direct effects occur to non-target species if WS program personnel inadvertently kill, injure, or harass animals that are not targeted by management actions. In general, these effects result from the use of methods that are not completely selective for target species. Non-target migratory bird and other non-target wildlife are usually not affected by WS management methods, except for the occasional scaring from harassment devices. In these cases, migratory birds and other affected non-target wildlife may temporarily leave the immediate vicinity from which they were frightened, but would likely return after cessation of the action. WS' take of non-target species during bird damage management activities has been extremely low and is not expected to increase above current levels of take.

According to Iowa WS Annual Reports, no non-target birds were known to have been killed during WS' bird damage management from FY04 through FY06.

While every precaution is taken to safeguard against killing non-target birds, changes in local flight patterns and other unanticipated events could occasionally result in the incidental death of unintended species. These incidents are rare and have not occurred during Iowa WS activities in the recent past and would not affect the populations of any species under the current program.

Beneficial Effects on Non-target Species. Interspecific brood parasitism is defined as the laying of an egg or eggs by one species of bird into a host nest of another species of bird. Unaware of the foreign eggs, the host normally accepts and incubates the egg(s) and raises the young as its own. The Brown-headed cowbird is one of five species of cowbirds that are brood parasites (Orians 1985), which have lost the instinct to build nests, incubate eggs, and care for young (Smith 1977). As a result of brood parasitism, egg and chick survival of the host species is jeopardized. In most cases of brood parasitism, the young of the host species die because they are unable to compete with the cowbird chick(s) for food and space inside the nest. Aggressive nesting area colonizers such as gulls will force other species, such as terns and plovers, from prime nesting areas. Cormorants, besides competing for nesting space, indirectly destroy vegetation at colony sites as their droppings accumulate, making these areas unsuitable for rapid repopulation by many colonial nesting species. Such programs to reduce interspecific competition between native species and invasive species have the greatest chance of successfully reducing bird damage and conflicts to wildlife species, since all bird damage management methods could be implemented or recommended by WS.

T/E Species Effects. Special efforts are made to avoid jeopardizing T/E species through biological assessments of the potential effects and the establishment of restrictions or minimization measures. A Section 7 Programmatic Consultation and USFWS Biological Opinion between the USFWS and WS (USDI 1992), determined that certain damage management methods could have a "may affect" on American peregrine falcons (*Falco peregrinus*), Bald eagles, and Whooping cranes (*Grus americana*). The BO concluded that damage management methods previously mentioned in this EA, which are used in bird damage management, will not jeopardize the continued existence or adversely modify critical habitats of those species. SOPs to avoid negative affects to T/E species, such as bait placement, as well as label restrictions and the inherent safety of proposed WS methods preclude hazards to non-target and T/E species as described in USDA (1997 Appendix F) and in Section 3.5 of this EA. Iowa

WS reviewed the list of T/E species found in Iowa and determined that the use of bird damage management methods will have no effect on those T/E species or their critical habitats. Furthermore, WS has determined that the use of AC and lasers will have no effect on any listed T/E species.

SOPs listed in Chapter 3 preclude negative effects and the low non-target risk associated with WS methods precludes other adverse effects. In addition, WS bird damage management may benefit some of the species of special concern (*e.g.,* cowbird damage management could potentially increase neotropical bird populations). In addition, listed species should benefit from this alternative because of the control in issuing permits to minimize effects at known sites.

Iowa WS has conferred with the IDNR, which has determined that the current and proposed WS actions have no effect on Iowa State listed or species of special concern or their habitats and ecosystems. The IDNR, under its Comprehensive Wildlife Conservation Strategy, identifies and addresses the needs of species of special concern in the state. WS will periodically consult with the IDNR, Bureau of Endangered Resources to ensure that no actions taken in compliance with this EA will adversely affect Iowa-listed species. SOPs to avoid T/E effects were described in Chapter 3 (Section 3.5).

4.3.2.2 Alternative 2 - Technical Assistance Only

Adverse Effects on Non-target Species, including T/E Species. Alternative 2 would not allow any WS operational bird damage management in Iowa. There would be no adverse effect on non-target or T/E species from WS bird damage management under this alternative. Technical assistance or self-help information would be provided when requested to airport managers, city managers, agricultural producers, property owners, or others. Although technical assistance could lead to more selective use of bird damage management methods by private entities than that which would occur under Alternative 3, private efforts to reduce or prevent damage could result in less experienced persons implementing bird damage management methods and lead to greater risks to non-target wildlife. Hazards to raptors, Bald eagles, and other T/E species could be greater under this alternative than Alternative 1. It is possible that, similar to Alternative 3, frustration from the resource owner due to the inability to reduce losses could lead to illegal use of toxicants, or other non-specific damage management methods could lead to unknown effects to non-target species populations, including T/E species. Potential hazards and threats to raptors, Bald eagles and other T/E species could therefore be greater under this alternative if methods that are less selective or toxicants that cause secondary poisoning are used by frustrated private individuals or property managers.

Beneficial Effects on Non-target Species. The ability to reduce negative effects caused by birds to wildlife species and their habitats, including T/E species, would be variable based upon the skills and abilities of the person implementing actions. It would be expected that this alternative would have a greater chance of reducing damage than Alternative 3 since WS would be available to provide information and advice but less of a chance of reducing damage than Alternative 1.

4.3.2.3 Alternative 3 - No WS Bird Damage Management

Adverse Effects on Non-target Species. Alternative 3 would not allow any WS bird damage management in Iowa. There would be no impact on non-target or T/E species from WS bird damage management under this alternative. However, private efforts to reduce or prevent damage could increase; resulting in less experienced persons implementing damage management

methods and could lead to greater take of non-target wildlife than the *No Action/Proposed Action* Alternative. Hazards to raptors, Bald eagles, and other T/E species could, therefore, be greater under this alternative than Alternative 1. As in Alternative 2, possible frustrations caused by the inability to reduce losses could lead to illegal use of toxicants by others, which could impact local non-target species populations, including T/E species.

Beneficial Effects on Non-target Species. The ability to reduce negative effects caused by birds to wildlife species and their habitats, including T/E species, would be variable based upon the skills and abilities of the person implementing control actions.

4.3.3 Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets

The effects of WS bird damage management upon safety include potential benefits by fostering a safer environment through reduced disease transmission and bird/aircraft strikes, and potential negative effects that might result from the exposure of the public to bird damage management methods. WS uses chemical methods that are deemed appropriate to reduce a variety of damage problems, and WS personnel are aware of the potential risks to non-target species and humans (See Appendix C for a detailed description of bird damage management methods and chemicals potentially used by WS). The use of pesticides by WS is regulated by the EPA through the FIFRA, by state law, the IDALS and by WS Directives. Along with effectiveness, cost and social acceptability, risk is an important criterion for the selection of damage management strategies. Determination of risks to non-target animals, the public, and WS personnel are important prerequisites for successful application of the IWDM approach. Based on a thorough Risk Assessment (USDA 1997 Appendix P), APHIS concluded that, when chemicals used by WS are applied according to label directions, they are selective for target individuals or populations, and such use has negligible adverse effects on the environment.

4.3.3.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action)

Under this alternative, bird damage management conducted by WS in Iowa is guided by WS, APHIS, and USDA Directives, Cooperative Agreements and MOUs with other agencies, and federal, state, and local laws and regulations. WS is not aware of any record of harm or injury that has occurred to the public or pets as a result of WS bird damage management in Iowa. The bird damage management methods used by Iowa WS are discussed in more detail in Appendix C of this EA and USDA (1997) and used as prudently as possible. In addition, the current damage management strategies will continue to address complaints on a case-by-case basis, providing the most flexibility in addressing damage complaints.

Labeling requirements and use restrictions are built-in minimization measures which assure that use of registered chemical products would avoid significant adverse effects on human or pet health. Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible effects on the environment (USDA 1997).

Carbon dioxide (CO_2) gas is a colorless, odorless, noncombustible gas approved by the AVMA as a euthanasia method (Beaver et al. 2001) and is a common euthanasia agent apparently because of its ease of use, safety, and efficacy for euthanizing many animals in a short time span. The advantages of using CO_2 are: 1) its rapid depressant, analgesic, and anesthetic effects; 2) its ready availability in convenient compressed gas cylinders; 3) its low cost; 4) its chemical features (nonflammable, nonexplosive, of minimal hazard to personnel when used with properly designed equipment); and 5) the lack of residual accumulation in animal tissues.

Other Bird Damage Management Chemicals. Non-lethal bird damage management chemicals that might be used by WS include the tranquilizer AC. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before the Food and Drug Administration (FDA) will register them. Any operational use of AC would be in accordance with labeling requirements under FDA and state laws and regulations which are established to avoid unreasonable adverse effects on the environment.

Mechanical Damage Management Methods

Many mechanical damage management methods may be used or recommended by WS to reduce damage or the potential for damage (Appendix C). Some of these methods include:

- Resource management, which include practices that may be used by resource owners to reduce the potential for wildlife damage.
- Cultural practices, which generally involve modifications to the level of care or attention given to the resource; these may vary depending on the age, size, and location of the resource.
- Environmental/habitat modification is an integral part of bird damage management designed to render sites less attractive to certain bird species. Most habitat management revolves around airports and bird aircraft strike problems.
- Animal behavior modification refers to tactics that alter the behavior of wildlife in order to reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982).
- Live traps, designed to capture birds, are made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being targeted. Traps are baited with grains or other appealing food.
- Egg addling/destruction is the practice of destroying the embryo (only) prior to hatching or the entire egg, respectively.
- Shooting is more effective as a dispersal technique than as a way to reduce bird densities when a large number of birds are present; however, some birds may be removed using shooting when warranted (*i.e.*, at airports if the birds are difficult to disperse).
- Snap traps are spring-activated traps with wooden bases (*e.g.*, rat traps) which can be used effectively to kill offending birds, such as woodpeckers damaging structures.

The above analysis indicates that human and pet health risks from use of WS method would be virtually nonexistent, and in fact, may reduce hazards to people.

4.3.3.2 Alternative 2 -Technical Assistance Only Program

Under this alternative, operational bird damage management assistance by WS would not be authorized in the state. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing chemical or other damage management methods and leading to a greater risk than the current/proposed action. WS would only provide advice and, in some cases, equipment or materials *(i.e.,* by loan) to persons who would then conduct their own damage management actions. Concerns about human or pet health risks from WS' use of bird damage management chemical methods would be alleviated because no such use would occur.

Commercial pest control services would be able to use Avitrol if certified and such use would

likely occur to a greater extent in the absence of WS' assistance. Use of Avitrol, in accordance with label requirements, should preclude any hazard to the public or pets. However, hazards to humans and pets could be greater under this alternative than under Alternative 1 if chemicals that are less selective or that cause secondary poisoning are used. Frustration caused by the inability to reduce losses could lead to illegal use of toxicants by others, which could lead to unknown impacts to humans and pets.

4.3.3.3 Alternative 3 - No WS Bird Damage Management Program

Alternative 3 would not allow any WS bird damage management in Iowa. The absence of WS bird damage management in Iowa could result in adverse effects on human health and safety because of increases in bird-aircraft strikes and avian-borne diseases. Airport managers and air safety officials are concerned that the absence of a WS bird damage management program would fail to adequately address complex wildlife hazard problems faced by the aviation community. Property managers fear that the absence of bird damage management activities would lead to accumulation of bird feces and feathers (*i.e.,* from gulls, etc.) at rooftop ventilation systems and work areas, which may increase the risk of disease transmission or other health risks to humans. Hence, potential effects of not conducting such work could lead to an increased incidence of bird strikes to aircraft, human injuries, property damage or loss of life.

However, commercial pest control services and private individuals would be able to use Avitrol, if certified and such use would likely occur to a greater extent in the absence of WS' assistance, potentially resulting in less experienced persons implementing damage management methods and leading to a greater risk than the *No Action/Proposed Action* Alternative. Use of Avitrol, in accordance with label requirements, would preclude any hazard to members of the public. However, hazards to humans and pets could be greater under this alternative if other chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants, and could pose secondary poisoning hazards to pets and to mammalian and avian scavengers under this alternative. Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

4.3.4 Efficacy of WS Bird Damage Management Methods

Under the current program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992) and WS Directives. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method and the guidance provided by WS Directives and policies for WS personnel.

The efficacy of each alternative is based on the types of methods employed under that alternative. WS personnel are trained in the use of each method, and are certified by the IDALS as restricted-use pesticide applicators for each pesticide that is used. Some methods may be more or less effective, or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors. Because these various factors may at times preclude use of certain methods, it is important to maintain the widest possible selection of damage management methods to most effectively resolve bird damage problems (see Appendix C for a more detailed discussion of methods).

4.3.4.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action)

The following are some methods that would be available under Alternative 1 (see Appendix C for

more detail).

Animal Behavior Modification. This refers to tactics that alter the behavior of wildlife in order to reduce damages. Animal behavior modification may employ scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982).

Alpha-chloralose (AC) is delivered as bait to targeted birds and is selective and effective in immobilizing targeted individuals. Some unintentional mortality may occur due to differences in target bird weight, aggressiveness in feeding, or post baiting behavior.

Lasers are selective and an effective non-lethal method to disperse some bird species under the correct lighting conditions and present virtually no health hazards to the birds (APHIS 2001).

Live traps are used in locations where a targeted population is causing damage or where other techniques cannot be safely used. Live traps, as applied and used by WS, are highly selective for target species. If a non-target animal is accidentally captured it can easily be released unharmed.

Nest box traps are effective and selective in capturing secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976).

Snap traps are used to remove individual birds, primarily Northern flickers and other woodpeckers, that are causing damage. Effectiveness can be increased by placing the traps near the location of damage and by baiting the trap with food items which are highly attractive to the targeted species and less attractive to non-target birds.

Nest destruction is selective for targeted species/individuals because nests would be identified by species-specific characteristics and nesting material. Heusmann and Bellville (1978) reported this method effective, but time-consuming.

Egg addling/destruction is highly selective because the eggs of specific birds are targeted for destruction; consequently, there are no adverse effects to other species. This method is considered highly selective, but time consuming.

Shooting is selective for target species (USDA 1997). It would also be effective as a dispersal technique or to reinforce dispersal techniques.

There are several other bird damage management methods used by WS under the current program. Appendix C provides a description of each.

4.3.4.2 Alternative 2 - Technical Assistance Only Program

Under this alternative, WS would not have an operational bird damage management program to assist requesters to reduce bird damage. Efficacy of the WS program would not be a consideration. Assistance would be limited to providing technical assistance, instructional demonstrations and self-help advice on legally available methods.

4.3.4.3 Alternative 3 - No WS Bird Damage Management Program

Under this alternative, WS bird damage management would not be a consideration because the Iowa WS program would not conduct operational activities nor provide technical assistance to entities experiencing bird damage. Private efforts to reduce or prevent damage would probably

increase, which could reduce efficacy of bird damage management methods. It is reasonable to assume that frustration caused by the inability to reduce losses through legal means in a timely manner could lead to the use of illegal techniques, which could result in unwanted impacts to bird populations and the environment.

4.4 CUMULATIVE EFFECTS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under Alternatives 1 and 2, WS would address damage associated with birds in situations throughout the state. The Iowa WS bird damage management program would be the primary federal program with bird damage management responsibilities; however, some state and local government agencies may conduct bird damage management activities in Iowa as well. Through ongoing coordination and cooperation with the USFWS, IDOT, FAA, IDNR, IDPH, and IDALS, WS is aware of other bird damage management activities and may provide technical assistance in such efforts. WS does not normally conduct operational damage management concurrent with other agencies in the same area, but may conduct bird damage management at adjacent sites within the same time frame. In addition, commercial pest control companies may conduct bird damage management in the same area. The potential cumulative impacts analyzed in this EA could occur either as a result of WS bird damage management, or as a result of the effects of other agencies and individuals. Those activities and the birds removed are tracked by the USFWS through their permitting system to ensure no long-term cumulative adverse affects to bird populations. The USFWS annually reviews the numbers of migratory birds taken under DPs (50 CFR 21.41) and has the ability to determine if the cumulative effects of all take under DPs may be negatively affecting a given species.

Cumulative Impacts on Wildlife Populations

Bird damage management methods used or recommended by the WS program in Iowa will have no cumulative adverse effects on target and non-target wildlife populations. Population trend data indicate that target bird populations have remained relatively stable or are increasing in Iowa, USFWS Region 3 and the BBS Eastern Region. When damage management actions are implemented by WS, the potential lethal take of non-target species is expected to be minimal or non-existent.

Cumulative Impact Potential from Non-Chemical Methods

Non-chemical methods used or recommended by WS' bird damage management program may include exclusion (various types of barriers), localized habitat modification (structures or vegetation), live trapping followed by euthanasia, harassment of birds or bird flocks, nest and egg destruction, and shooting.

Because shooting may be considered a component of the non-chemical cumulative impact, the deposition of lead shot in the environment is a factor considered in this EA.

Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species feed were observed more than one hundred years ago (Sanderson and Belrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. *"Beginning September 1, 1991, the contiguous 48 United*

States, and the states of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. "Certain other species" refers to those species, other than waterfowl or coots, affected by reason of being included in aggregate bags and concurrent seasons."

All Iowa WS bird damage management shooting activities involving waterfowl, coots and "certain other species" conform to federal, state and local laws. Consequently, no deposition of lead in nontoxic shot zones is likely to occur as a result of Iowa WS' bird damage management actions. Therefore, cumulative impacts are not likely to occur if lead shot is used.

Roost Harassment/Relocation. Some potential exists for cumulative impacts to human health and safety related to the harassment of flocks of birds in urban environments. If birds are dispersed from one site and relocate to another where human exposure to concentrations of bird feces occurs over time, human health and safety could be threatened. If WS is providing operational assistance in relocating such birds, coordination with local authorities will be conducted to assure that the birds do not re-establish in other undesirable locations.

SUMMARY

No significant cumulative environmental impacts are expected from any of the alternatives analyzed in this EA (Table 4-4). Under the Current/Proposed Action, the lethal removal of birds by WS would not have a significant impact on overall bird populations in Iowa, USFWS Region 3 or in the BBS Eastern Region, but some local reductions may occur. No risk to public safety is expected when WS' services are provided and accepted by requesting individuals under Alternative 1, since only trained and experienced wildlife biologists/specialists would conduct and recommend bird damage management activities. There

Table 4.4 Comparisons of Issues/Impacts and Alternatives.

Issues/Impacts	*Alternative 1*	*Alternative 2*	*Alternative 3*
Effects of WS Bird Damage Management on Target Species Populations	WS would have no effect on local or regional bird populations. If resource owners conduct bird damage management, effects would be more or less than Alternative 2 or 3 dependent on the efforts and methods used.	Effects similar to Alternative 1; however, could be more adverse depending on the level of control by others.	Effects similar to Alternative 1; however, could be more adverse depending on the level of control by others.
Effects on non-target species, including T/E species	No adverse affects from WS activities. Potential positive effects to those species that are being negatively impacted by invasive target species.	No adverse effects from WS activities. Potential adverse affects from others if toxicants or other methods are misused.	No adverse affects from WS activities. Potential adverse effects from others if toxicants or other methods are misused.
Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets	No adverse affects from WS activities. Potential positive effect from reduced risks from bird disease transmissions or bird aircraft strikes.	Potential negative effect from the misuse of methods or toxicants or increased disease transmission or bird strike risks.	Potential negative effect from the misuse of methods or toxicants or increased disease transmission or bird strike risks.
Efficacy of WS Bird Damage Management Methods	Provides most effective means to reduce bird damage or potential bird damage.	Moderate level of effectiveness if WS technical assistance recommendations are followed.	Least effective because no professional assistance would be available to requesters.

is an increased risk to public safety when persons who reject WS assistance and recommendations under Alternative 1 conduct their own bird damage management, and when no WS assistance is provided (Alternative 3). In all three alternatives, however, it would not be to the point that the impacts would be significant. Although some persons will likely be opposed to WS' participation in bird damage management activities on public and private lands in Iowa, the analysis in this EA indicates that a WS adaptive integrated bird damage management program would not result in significant cumulative adverse impacts on the quality of the human environment.

CHAPTER 5: LIST OF PREPARERS, REVIEWERS AND PERSONS CONSULTED

5.1 PREPARERS AND REVIEWERS

Ernie Colboth, USDA-APHIS-WS, Des Moines, Iowa
Edwin Hartin, USDA-APHIS-WS, Columbia, Missouri
David Hayes, USDA-APHIS-WS, Billings, Montana

5.2 PERSONS CONSULTED

Jody Millard, USFWS, Rock Island, Illinois
Bill Bunger, IDNR, Chariton, Iowa
Larry Harrison, UWFWS, Fort Snelling, Minnesota
Jessica Little, USDA APHIS WS, Springfield, Illinois
Stephanie Shepherd, IDNR, Boone, Iowa
Sandy Wright, USDA APHIS WS, Sandusky, Ohio
Ann Garvey, IDPH, Des Moines, Iowa
Michelle McEnany, IDOT, Des Moines, Iowa
Dr. David Schmitt, IDALS, Des Moines, Iowa

APPENDIX A

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APPENDIX B

AUTHORITY AND COMPLIANCE

USDA-APHIS-Wildlife Services

USDA is authorized and directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for USDA is the *Act of March 2, 1931* and the *Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988 (7 USC 426-426c; 46 Stat. 1468)*, as amended in the Fiscal Year 2001 Agriculture Appropriations Bill, which provides that:

"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."

Since 1931, with the changes in societal values, APHIS, WS policies and programs place greater emphasis on the part of the Act discussing "bringing [damage] under control," rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative authority of APHIS, WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

Under the Act of March 2, 1931, and 7 U.S.C. §426c, APHIS may carry out these wildlife damage management programs itself, or it may enter into cooperative agreements with states, local jurisdictions, individuals and public and private agencies whereby they may fund and assist in carrying out such programs. Id. These laws do not grant any regulatory authority. Therefore, there are no regulations promulgated under these statutes for wildlife services or animal damage management activities.

To fulfill this Congressional direction, WS conducts activities to prevent or reduce wildlife damage to agricultural, industrial and natural resources, property, and threats to public health and safety on private and public lands in cooperation with other federal, state and local agencies, private organizations, and individuals. Therefore, wildlife damage management is not based on punishing animals but as one means of reducing damage, with actions being implemented using the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated. The need for action is derived from the specific threats to resources or the public. WS' mission is to improve the coexistence of people and wildlife by providing federal leadership to reduce problems.

U.S. Fish and Wildlife Service

The USFWS is the primary federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife resources and their habitats. The USFWS mission is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Responsibilities are shared with other federal, state, tribal, and local entities; however, the USFWS has specific responsibilities for T/E species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters that the USFWS administers for the management and protection of these resources.

The USFWS regulates the taking of migratory birds under the four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada), Mexico, Japan, and Russia. Regulations allowing the take of migratory birds are authorized by the MBTA (16 U.S.C. Sec's. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. Sec. 712). The Acts authorize and direct the Secretary of the Interior to allow hunting, taking, and killing of migratory birds subject to the provisions of, and to carry out the purposes of, the four migratory bird treaties.

The 1916 treaty with Great Britain was amended in 1999 by the governments of Canada and the United States. Article II of the amended United States-Canada migratory bird treaty (Treaty) states that to ensure the long-term conservation of migratory birds, migratory bird populations shall be managed in accordance with conservation principles that include (among others): 1) to manage migratory birds internationally, 2) to sustain healthy migratory bird populations for harvesting needs, and 3) to provide for and protect habitat necessary for the conservation of migratory birds.

Article III of the Treaty states that the governments should meet regularly to review progress in implementing the Treaty. The review shall address issues important to the conservation of migratory birds, including the status of migratory bird populations, the status of important migratory bird habitats, and the effectiveness of management and regulatory systems. The governments agree to work cooperatively to resolve identified problems in a manner consistent with the principles of the Treaty and, if the need arises, to conclude special arrangements to conserve and protect species of concern.

Article IV of the Treaty states that each government shall use its authority to take appropriate measures to preserve and enhance the environment of migratory birds. In particular, the governments shall, within their constitutional authority, seek means to prevent damage to such birds and their environments and pursue cooperative arrangements to conserve habitats essential to migratory bird populations.

Article VII of the Treaty authorizes permitting the take and kill of migratory birds that, under extraordinary conditions, become seriously injurious to agricultural or other interests.

The USFWS regulates take of bird species that are listed as migratory under the MBTA and those that are listed as T/E under the ESA. The USFWS cooperates with the WGFD and WS by recommending measures to avoid or minimize take of T/E species. The term "*take"* is defined by the ESA (section 3(19)) to mean "*to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."* The terms "*harass"* and *"harm"* have been further defined by USFWS regulations (50 CFR section 17.3), as follows: 1) *harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering*; 2) *harm means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering*.

The USFWS authority for action is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

"From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President."

The authority of the Secretary of Agriculture, with respect to the MBTA, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

Federal Aviation Administration

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations and is authorized to reduce wildlife hazards at commercial and non-commercial airports. Many of these regulations are codified in the FARs. The FAA is responsible for setting and enforcing the FARs and policies to enhance public safety. For commercial airports, 14CFR, Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. At non-commercial airports, the FAA also expects that the airport be aware of wildlife hazards in and around their airport and take corrective action if warranted; the FAA uses Advisory Circular 150/5200-33 to guide their decision making process.

Federal Aviation Administration (FAA) - Regulations concerning Bird Aircraft Strike Hazards (BASH)

The FAA is empowered to issue airport operation certificates to airports serving air carriers, and to establish minimum safety standards for the operation of airports. Some of these regulations and polices directly involved the management of wildlife and wildlife hazards on and/or near airports. Under the Federal Aviation Regulations (FAR) 139.337 Wildlife Hazard Management, an airport is required to conduct a Wildlife Hazards Assessment and a Wildlife Management Plan when specific wildlife event(s) occur. Under the FAA/ADC Memorandum of Understanding (MOU), the WS program supports all of the requirements contained in FAR 139.337. FAA Certalert No. 97-02 further clarifies the roles of, and relationships between, the FAA and WS with regards to wildlife hazards on or near airports (USDA Managing Wildlife Hazards at Airports July 1998)

Iowa Department of Natural Resources (IDNR)

"A department of natural resources is created, which has the primary responsibility for state parks and forests, protecting the environment, and managing energy, fish, wildlife, and land and water resources in this state" (Iowa Administrative Code §§455A.2).

Iowa Department of Agriculture and Land Stewardship (IDALS)

The IDALS is charged, with the suppression and prevention of infectious and contagious diseases among animals within Iowa (Iowa Code of Law Chapter 163). The IDALS is also charged with the regulation of animals in the pet industry including the transportation of the animals, the sale of the animals, and only permitting the sale of animals which appear to be free from infectious or communicable diseases (Iowa Code of LawChapter 162). The IDALS has the power to:

1. Make all necessary rules for the suppression and prevention of infectious and contagious diseases among animals within the state.
2. Provide for quarantining animals affected with infectious or contagious diseases, or that have been exposed to such diseases, whether within or without the state.
3. Determine and employ the most efficient and practical means for the prevention, suppression, control, and eradication of contagious or infectious diseases among animals.
4. Establish, maintain, enforce, and regulate quarantine and other measures relating to the movements and care of diseased animals.
5. Provide for the disinfection of suspected yards, buildings, and articles, and the destruction of such animals as may be deemed necessary.
6. Enter any place where any animal is at the time located, or where it has been kept, or where the carcass of such animal may be, for the purpose of examining it in any way that may be necessary to determine whether it was or is infected with any contagious or infectious disease.
7. Regulate or prohibit the arrival in, departure from, and passage through the state, of animals infected with or exposed to any contagious disease; and in case of violation of any such regulation or prohibition, to detain any animal at the owner's cost.
8. Regulate or prohibit the bringing of animals into the state, which, in its opinion, for any reason, may be detrimental to the health of animals in the state.
9. Co-operate with and arrange for assistance from the USDA in performing its duties under this chapter.
10. Impose civil penalties as provided in this chapter. The department may refer cases for prosecution to the attorney general.

Iowa Department of Public Health

In accordance with Iowa Administrative Code, Section 641, Chapter 1.2 (139A), the Director of Public Health is the principal officer of the state to administer disease reporting control procedures. The State Health Registry of Iowa, administered by the Department of Epidemiology of the College of Public Health at the University of Iowa, is a public health authority for the purposes of collecting disease data.

Iowa Department of Transportation

IDOTA is authorized by Iowa Code Chapter 329.5 Prevention of Airport Hazards, any municipality owing or controlling an airport may maintain actions in equity to restrain and abate as nuisances the creation or establishment of airport hazards appertaining to said airports, in violation of any regulations adopted or established pursuant without the territorial limits of said municipality.

Compliance with Federal Laws, Executive Orders and Regulations

WS consults and cooperates with other federal and state agencies as appropriate to ensure that all WS

activities are carried out in compliance with all applicable federal laws.

National Environmental Policy Act: All federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). WS and the USFWS follow CEQ regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and WS follows the APHIS Implementing Guidelines (7 CFR 372) as a part of the decision-making process. These laws, regulations, and guidelines generally outline five broad types of activities to be accomplished as part of any project: public involvement, analysis, documentation, implementation, and monitoring. NEPA also sets forth the requirement that all major federal actions be evaluated in terms of their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. Federal activities affecting the physical and biological environment are regulated in part by CEQ through regulations in 40 CFR, Parts 1500-1508. In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

Pursuant to NEPA and CEQ regulations, this EA documents the analysis of a proposed impact resulting from federal actions, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of NEPA are infused into federal agency actions. This EA was prepared by integrating as many of the natural and social sciences as warranted, based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

Endangered Species Act: Under the ESA, all federal agencies are charged with a responsibility to conserve endangered and threatened species and to utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). WS conducts Section 7 consultations with the USFWS to utilize the expertise of the USFWS to ensure that, "*Any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . .*" (Sec.7 (a) (2)). WS conducts formal Section 7 Consultations with the USFWS at the national level (USDI 1992) and consultations with the USFWS at the local level as appropriate (J. Millard, USFWS Ecological Services letter to E. Colboth, WS, DATE and USFWS Interagency Consultation).

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as amended: The MBTA provides the USFWS regulatory authority to protect species of birds that migrate outside the United States. The law prohibits any "*take*" of these species by private entities, except as permitted by the USFWS; therefore the USFWS issues permits to private entities for reducing bird damage (50 CFR 21.41). WS provides on-site assessments for persons experiencing migratory bird damage to obtain information on which to base damage management recommendations. Damage management recommendations could be in the form of technical assistance or operational assistance. In severe cases of bird damage, WS provides recommendations to the USFWS for the issuance of DPs to private entities. Starlings, pigeons, house sparrows and domestic waterfowl are not classified as protected migratory birds and therefore have no protection under the MBTA. USFWS DPs are also not required for "yellow-headed, red-winged, rusty, and Brewer's blackbirds, cowbirds, all grackles, crows, and magpies found committing or about to commit depredation upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance" (50 CFR 21.43).

Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978): The BGEPA prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. Take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Transport includes convey or carry by any means; also deliver or receive for conveyance. If compatible with the preservation of bald and golden eagles, the Secretary of

the Interior may issue regulations authorizing the taking, possession and transportation of these eagles for scientific or exhibition purposes, for religious purposes of Indian tribes or for the protection of wildlife, agricultural or other interests. Bald eagles may not be taken for any purpose unless the Secretary issues a permit prior to the taking. § 668a.

Federal Insecticide, Fungicide, and Rodenticide Act: FIFRA requires the registration, classification and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing FIFRA. All pesticides used or recommended by the WS program in Iowa are registered with, and regulated by, the EPA and the IDALS. Iowa WS uses all chemicals according to label directions as required by the EPA and IDALS.

National Historical Preservation Act (NHPA) of 1966 as amended: The NHPA and its implementing regulations (CFR 36, 800) require federal agencies to initiate the section 106 process if an agency determines that the agency's actions are undertakings as defined in Sec. 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties. If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, the agency official has no further obligations under section 106. Each of the bird damage management methods described in this EA that might be used operationally by WS: does not cause major ground disturbance, does not cause any physical destruction or damage to property, does not cause any alterations of property, wildlife habitat, or landscapes, and does not involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the proposed action are not generally the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

Noise-making methods such as propane exploders, pyrotechnics, or firearms that are used at or in close proximity to historic or cultural sites for the purposes of hazing or removing nuisance predators have the potential for audible effects on the use and enjoyment of a historic property. However, such methods would only be used at a historic site at the request of the owner or manager of the site to resolve a damage or nuisance problem, which means such use would be to benefit the historic property. A built-in mitigating factor for this issue is that virtually all of the methods involved would only have temporary effects on the audible nature of a site and can be ended at any time to restore the audible qualities of such sites to their original condition with no further adverse effects. Site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary in those types of situations.

Native American Graves Protection and Repatriation Act: The Native American Graves Protection and Repatriation Act requires federal agencies to notify the Secretary of the Department that manages the federal lands upon the discovery of Native American cultural items on federal or tribal lands. Federal projects would discontinue work until a reasonable effort has been made to protect the items and the proper authority has been notified.

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Act of 1970 and its supplementing regulations (29CFR1910) on sanitation standards states that "Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practical, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected." This standard includes birds that may cause safety and health concerns at workplaces.

Environmental Justice and Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations: Environmental Justice has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Executive Order 12898 requires Federal agencies to make Environmental Justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. A critical goal of Executive Order 12898 is to improve the scientific basis for decision-making by conducting assessments that identify and prioritize environmental health risks and procedures for risk reduction. Environmental Justice is a priority within USDA, APHIS, and WS. APHIS plans to implement Executive Order 12898 principally through its compliance with the provisions of NEPA.

WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure Environmental Justice. WS personnel use WDM methods as selectively and environmentally conscientiously as possible. All chemicals used by WS are regulated by the EPA through FIFRA, IDALS, by MOUs with Federal land managing agencies, and by WS Directives. Based on a thorough Risk Assessment, USDA (1997, Appendix P) concluded that when WS program chemicals are used following label directions, they are highly selective for the target species or populations, and such use has negligible impacts on the environment. The WS operational program properly disposes of any excess solid or hazardous waste. WS assistance is provided on a request basis in cooperation with State and local governments and without discrimination against people who are of low income or in minority populations. The nature of WS's PDM activities is such that they do not have much, if any, potential to result in disproportionate environmental effects on minority or low-income populations. Therefore, no such adverse or disproportionate environmental impacts to such persons or populations are expected.

Executive Order 13045 - Protection of Children from Environmental Health and Safety Risks: Children may suffer disproportionately from environmental health and safety risks, including their developmental physical and mental status, for many reasons. Because WS makes it a high priority to identify and assess environmental health and safety risks, WS has considered the impacts that alternatives analyzed in this EA might have on children. All WS predator damage management is conducted using only legally available and approved damage management methods where it is highly unlikely that children would be adversely affected at all, let alone in any disproportionate way. Based on the Risk Assessment (USDA 1997, Appendix P) concluded that when WS program chemicals and non-chemical methods are used following label directions and normally accepted safety practices and WS standard operating procedures, such use has negligible impacts on the environment or on human health and safety, which includes the health and safety of children.

Executive Order 13112 - Invasive Species: Authorized by former President Clinton, EO 13112 establishes guidance to federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations and provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control and promote public education on invasive species.

The EO also established an Invasive Species Council (Council) whose members include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the

EPA. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council oversees: 1) the implementation of this order, 2) that federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, 3) the development of recommendations for international cooperation in addressing invasive species, 4) the development, in consultation with the CEQ, of guiding principles for federal agencies, 5) the development of a coordinated network among federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health, 6) the establishment of a coordinated, up-to-date information-sharing system and 7) preparation and issuance of a national Invasive Species Management Plan.

Executive Order 13186 and MOU between USFWS and WS: EO 13186 directs federal agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between WS and the USFWS, in coordination with state, tribal, and local governments. A national-level MOU between the USFWS and WS has been drafted to facilitate the implementation of EO 13186.

APPENDIX C

BIRD DAMAGE MANAGEMENT METHODS AVAILABLE FOR USE IN IOWA

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. IWDM would integrate and apply practical methods of prevention and reduce damage by wildlife while minimizing harmful effects of damage reduction measures on humans, other species, and the environment. IWDM may incorporate resource management, physical exclusion and deterrents, and population management, or any combination of these, depending on the characteristics of specific damage problems.

In selecting damage management techniques for specific damage situations and the methods under each alternative, consideration is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration is also given to the status of target and potential non-target species, local environmental conditions and effects, social and legal aspects, and relative costs of damage reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. These factors are evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

A variety of methods (Table C-1) are potentially available to the WS program in Iowa relative to the management or reduction of bird damage. WS develops and recommends or implements IWDM strategies rooted in sound resource management and wildlife management philosophies. Within each approach there may be a number of specific methods or tactics available.

Table C-1. Bird Damage Management Methods which would be Recommended or Used by WS under each Alternative.

Management Method	Alternative 1 Current Program	Alternative 2 Technical Assistance	Alternative 3 No Program
Habitat Management	Y	Y	No
Cultural Methods	Y	Y	No
Behavior Modification	Y	Y	No
Resource Management	Y	Y	No
Alpha-chloralose [1, 2]	Y	No	No
Live Traps	Y	Y	No
Shooting	Y	Y	No
Euthanasia	Y	Y	No

1 Only certified applicators can use these chemicals.
2 Only registered for USDA/APHIS/WS use.

Various federal, state, and local statutes and regulations and WS Directives govern WS use of damage management tools and substances. The following methods and materials are recommended or used in technical assistance and operational damage management efforts of the WS program in Iowa. The effectiveness of the program can be defined in terms of reduced economic losses, decreased health hazards, minimized property damage and overall improved quality of life.

NON-LETHAL METHODS

On rare occasions, a bird may inadvertently die from the management methods that are implemented. These birds may be killed or injured from capturing/handling procedures or unknown causes. For example, individual bird weight, stomach contents, or physiology may make it more or less susceptible to certain non-lethal management methods. Therefore, conditions unknown to WS or beyond the control of WS may be responsible for some inadvertent mortality during implementation of some non-lethal damage management techniques.

Resource Management. Resource management includes a variety of practices that may be used by

resource owners to reduce the potential for wildlife damage. Implementation of these practices is appropriate when the potential for damage can be reduced without significantly increasing a resource owner's costs or diminishing his/her ability to manage resources pursuant to goals. Resource management recommendations are made through WS technical assistance efforts.

Alter Aircraft Flight Patterns. In cases where the presence of birds at airports results in threats to air traveler safety and when such problems cannot be resolved by other means, the alteration of aircraft flight patterns or schedules may be recommended. However, altering operations at airports to decrease the potential for hazards is not feasible unless an emergency situation exists. Otherwise, the expense of interrupted flights and the limitations of existing facilities make this practice prohibitive.

Relocation of damaging birds to other areas following live capture generally is not cost-effective. Since starlings, blackbirds, pigeons, and most other damaging species are common and numerous throughout Iowa, they are rarely, if ever, relocated because habitats in other areas are generally already occupied and/or the birds would cause similar problems at a new location. Relocation of wildlife often involves stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats, or translocated individuals simply leave the area.

However, there are exceptions to the rule for relocating birds. Relocation of damaging birds might be a viable solution and acceptable to the public when the birds are considered to have high value, such as migratory waterfowl or T/E species. In these cases, WS would consult with the USFWS and WGFD to coordinate capture, transportation, and selection of suitable relocation sites.

Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction could only be applied when dealing with a limited number of birds or nest sites. This method is used to discourage birds from constructing nests in areas, which may create nuisances for home and business owners. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high population densities. This method poses no imminent danger to pets or the public.

Cultural Methods. These generally involve modifications to the level of care or attention given to the resource, which may vary depending on the age, size, and location of the resource. Husbandry practices include, but are not limited to, techniques such as night feeding, indoor feeding, closing barns or corrals, removing spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).

Agricultural Producer/Property Owner Practices. These consist primarily of non-lethal preventive methods, such as cultural methods and localized habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer and property owners. Producers and property owners are encouraged to use these methods, basing their decisions on the level of risk, need, and professional judgment. Producer and property owner practices recommended by WS include:

Habitat Modification/Environmental is an integral part of bird damage management. The type, quality, and quantity of habitat are directly related to the wildlife that is produced. Therefore, habitat can be managed to not attract certain bird species or to repel certain birds. Most habitat management revolves around airports and bird aircraft strike problems in Iowa. Habitat management around airports is aimed at eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water in runway areas. Habitat management is often necessary to minimize damage caused by blackbirds and

starlings that form large roosts during late autumn and winter. Bird activity can be greatly reduced at roost sites by removing all of the trees or selectively thinning the stand. Roosts often will re-form at traditional sites, and substantial habitat alteration is the only way to permanently stop such activity (USDA 1997).

Animal Behavior Modification. This refers to tactics that alter the behavior of wildlife and consequently reduce damage. Animal behavior modification may employ scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982). Some devices used to accomplish this are:

- bird proof exclusions
- auditory scaring devices (*i.e*., electronic guards, propane exploders, pyrotechnics, distress calls and sound producing devices
- repellents (*i.*e., tactile repellents, surface coverings)
- visual scare devices (*i.e.,* scarecrows, dogs, lasers, spotlights, remote control devices)

Bird proof exclusions can be effective but are often cost-prohibitive, particularly because of the mobility of birds, which requires the use of overhead barriers as well as conventional netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Heavy plastic strips hung vertically in open doorways have been successful in some situations for excluding birds (Johnson and Glahn 1994). Plastic strips, however, can prevent filling of feed troughs at livestock feeding facilities or can be covered up when the feed is poured into the trough by the feed truck. Such strips are not practical for open-air feedlot operations that are not housed in buildings. Porcupine wire can be placed on ledges to exclude birds from perching or nesting on the ledges. This material can be expensive and debris often collects in the porcupine wire making it ineffective and unsightly.

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scarecrows, and audio distress/predator vocalizations, are often not practical in suburban, urban or rural areas if they disturb people or pets. In addition, under large feedlot situations they may not be appropriate because of the disturbance to livestock, although livestock would eventually habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics (Bomford and O'Brien 1990).

Tactile Repellents (*i.e*., sticky or tacky bird repellents such as Tanglefoot®, 4-The-Birds®, and Roost-No-More®) smeared or placed in wavy bands with a caulking gun will often discourage the birds from perching on/in structures, or in orchard, ornamental, and shade trees. The birds are not entrapped by the sticky substances, but rather dislike the tacky footing. A word of caution: some of the sticky bird repellents will discolor painted, stained, or natural wood siding. Others may run in warm weather, leaving unsightly streaks. It is best to try out the material on a small out-of-sight area first before applying it extensively. The tacky repellents can be applied to a thin piece of pressed board, ridged clear plastic sheets, or other suitable material, which is then fastened to the area where damage is occurring.

Surface Coverings: Some birds may be excluded from ponds or other areas using overhead wire grids (Fairaizl 1992, Lowney 1993). These lines should be made visible to the birds by hanging streamers or other objects at intervals along the wires. The objective is to discourage bird feeding activities and not cause bird injury or death. Overhead wire networks generally require little maintenance other than ensuring proper wire tension and replacing broken wires; the spacing varies with the species being excluded. Overhead wires have been demonstrated to be most effective on

sites ≤ two acres in size, but may be considered unsightly or aesthetically unappealing to some people. In addition, wire grids can render a pond unusable for boating, swimming, fishing, and other recreational activities. Installation costs are about $1,000 per surface acre for materials. The expense of maintaining wire grids may be burdensome for some people.

Balls approximately five inches in diameter can be used to cover the surface of a pond. A "ball blanket" renders a pond unusable for boating, swimming, fishing, and other recreational activities. This method is very expensive, costing about $131,000 per surface acre of water.

Scarecrows: The use of scarecrows has met with mixed results. These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium-filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed to, and learn to, ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972, Bomford and O'Brien 1990). Mylar tape has produced mixed results for effectively frightening birds (Dolbeer et al. 1986, Tobin et al. 1988). In general, scarecrows are most effective when they are moved frequently, alternated with other methods, and are well maintained.

Dogs: Dogs can be an effective tool for harassing birds and keeping them off turf and beaches (Conover and Chasko 1985, Woodruff and Green 1995). Around water, this technique appears most effective when the body of water to be patrolled is ≤ 2 acres in size (Swift 1998). Although dogs can be effective in keeping birds off individual properties, they do not contribute to a solution for the larger problem of overabundant/anthropogenically abundant bird populations (Castelli and Sleggs 1998). Swift (1998) reported that when harassment with dogs ceases, the number of birds usually eventually returns to pre-treatment numbers. WS has recommended and encouraged the use of dogs where appropriate.

Lasers are a relatively new technique used to frighten and disperse birds from their roosts or loafing areas. Although the use of a laser (the term "laser" is an acronym for Light Amplification by Simulated Emission of Radiation) to alter bird behavior was first introduced nearly 30 years ago (Lustick 1973), it received very little attention until recently, when it was tested by the NWRC. Results have shown that several bird species, such as Double-crested cormorants, Canada geese, other waterfowl, gulls, vultures (*Cathartes aura* and *Coragyps atratus*), and American crows all exhibited avoidance of laser beams during field trails (Glahn et al. 2001, Blackwell et al. 2002). The repellent or dispersal effect of a laser is due to the intense and coherent mono-wavelength light that, when directed at birds, can have substantial effects on behavior and may elicit changes in physiological processes (APHIS 2001). Best results are achieved under low-light conditions (*i.e.*, from sunset through dawn) by targeting structures or trees proximal to roosting birds, which reflects the beam. In field situations, habituation to lasers has not been observed (APHIS 2001).

The avian eye generally filters most damaging (*e.g.*, short-wavelength) radiation from the sun. In tests conducted with double-crested cormorants exposed to a relatively low-power Class-III B laser at a distance of 1 meter, no ocular damage was noted (APHIS 2001). However, unlike the eye of birds, the human eye, with the exception of the blink reflex, is essentially unprotected from thermal damage to retinal tissue associated with concentrated laser radiation. Lasers used by WS include the Class-III B, 5-mW, He-Ne, 633-nm Desman laser, and the Class II, battery-powered, 68-mW, 650-nm, diode Laser Dissuader. Because of the risk of eye damage, safety guidelines and specifications have been developed and are strictly followed by the user (Occupational Safety and Health Administration 1991, Glahn and Blackwell 2000).

Spotlights. The use of light to disturb or move loafing and or roosting birds can be an effective

technique. This method is similar to the laser, but with a much reduced price tag. The sacrifice in reduced pricing also limits the range and effectiveness of this method when compared to the laser.

Remote Control Devices. The use of remote control devices for the purpose of disturbing the activity or behavior of birds is a relatively new concept. These devices have been in existence for many years, but their durability, range, strength and cost have improved dramatically. Remote control devices are available in numerous forms such as: speed boats, helicopters, airplanes, sail boats, race cars, etc.

Live traps include:

Clover, funnel, and common pigeon traps are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. The entrances of the traps also vary greatly from swinging-door, one-way door, funnel entrance, to tip-top sliding doors. Traps are baited with grains or other food material, which attract the target birds. WS' standard procedure when conducting trapping operations is to ensure that an adequate supply of food and water is in the trap to sustain captured birds for several days. Active traps are checked daily, every other day, or as appropriate, to replenish bait and water and to remove captured birds.

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds, which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest box traps are used by WS for corrective damage management and are effective in capturing local breeding and post-breeding starlings and other targeted secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976).

Mist nets are more commonly used for capturing small-sized birds such as House sparrows, finches, etc. but can be used to capture larger birds such as ducks and Ring-necked pheasants (*Phasianus colchicus*). The mist net was introduced to the United States in the 1950's from Asia and the Mediterranean, where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net, usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net.

Cannon nets/rocket nets are normally used for larger birds such as pigeons, feral ducks, and waterfowl and use mortar projectiles to propel a net up and over birds, which have been baited to a particular site. This type of net is especially effective for waterfowl that are flightless due to molting and other birds which are typically shy to other types of capture.

Pole traps are generally set for raptors which perch on poles prior to making an attack. Problem hawks and owls can be safely trapped using a well padded (*i.e.*, with foam rubber wrapped in electricians tape, surgical tubing) steel leg-hold trap (No. 1½ or other appropriate size), snare or

tangle snares set on the top of poles. Erect poles that are 5 to 10 feet high near the threatened area where they can be easily seen and place one padded trap on top of each pole. The wire is run through the trap ring and the wire is secured to the pole and ground so that trapped birds may slide to the ground where they can rest.

Bal-chatri traps are small traps used for capturing birds of prey such as hawks and eagles. Live bait, such as pigeons, starlings, rodents, etc. is used to lure raptors into landing on the trap (Hygnstrom and Craven 1994) where nylon nooses entangle their feet and hold the bird. The trap is made of chicken wire or other wire mesh material and formed into a Quonset hut-shaped cage which holds the live bait. The outside top and sides are covered with many nooses consisting of strong monofilament line or stiff nylon string.

Chemical Agents

Methyl anthranilate (MA) (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. MA is currently registered as a repellent to protect turf from bird grazing and as a spray for airport runways to reduce bird activity/risk on or near airports. It is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they can be registered by EPA or the FDA.

Alpha-chloralose (AC) is a chloral derivative of glucose and a central nervous system depressant (*i.e.,* it depresses cortical centers in the brain). It is used as an immobilizing agent to capture and remove nuisance waterfowl and other birds, and for capture of birds for research purposes[14]. It is labor intensive to use and in some cases, may not be cost effective, depending on the application and purpose (Wright 1973, Feare et al. 1981), but is typically used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts and for the capture of birds for research. AC is typically delivered as a well-contained bait in small quantities with minimal hazards to pets and humans and the target birds; single bread or corn baits are fed directly to the target birds. WS personnel or other authorized personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment.

AC was eliminated from more detailed analysis in USDA (1997) based on critical element screening; therefore, environmental fate properties of this compound were not rigorously assessed. However, the solubility and mobility are believed to be moderate and environmental persistence is believed to be low. Bioaccumulation in plants and animal tissue is believed to be low. AC is used in other countries as an avian and mammalian toxicant. The compound is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). The dose used for immobilization is designed to be about 2 to 30 times lower than the LD_{50}. Mammalian data indicate higher LD_{50} values than birds. Toxicity to aquatic organisms is unknown (Wornecki et al. 1990) but the compound is not generally soluble in water and therefore should remain unavailable to aquatic organisms. Factors supporting the determination of this low potential included the lack of exposure to pets, nontarget species and the public, and the low toxicity of the active ingredient. Supporting rationale for this determination included relatively low total annual use and a limited number of potential exposure pathways.

LETHAL METHODS

14 With proper use and follow-up, AC reduces the potential for stress, injury and death in many situations over other capture techniques.

Egg addling/destruction is the practice of destroying the embryo prior to hatching. To successfully oil or addle eggs, each individual nest must be located and monitored until the goose has finished laying eggs and begins to incubate, at which point the eggs are oiled or addled. This can be difficult because Canada geese often nest in areas with limited access, including islands in ponds or rivers, thick areas of brush or grass, and similar places. Egg addling is conducted by vigorously shaking an egg numerous times, which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or oiling or spraying the eggs with a liquid, which covers the entire egg and prevents it from obtaining oxygen. Egg oiling techniques were successfully investigated and improved by the NWRC, resulting in a new label for this use under Section 25b of FIFRA, as amended, and prepared as a WS Technical Note in 1996. Although WS does not commonly use egg addling or destruction, it is a valuable damage management tool with demonstrated effectiveness.

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when a large number of birds are present. Normally, shooting is conducted with shotguns or air rifles. Shooting is a very intensive method normally used to remove a single offending bird, or group of birds (numbering less than 50) at one location. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rimfire and centerfire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are humanely killed. All firearms safety precautions are followed by WS when conducting bird damage management activities, and laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment*, which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Hunting and DPs. WS sometimes recommends that resource owners consider legal hunting as an option for reducing game bird species damage. Although legal hunting is impractical and/or prohibited in many urban/suburban areas, it can be used to reduce some populations of game birds. Legal hunting also reinforces harassment programs (Kadlec 1968). WS may recommend that resource owners receive DPs from the USFWS to legally take bird species that are protected under the MBTA. In these situations, WS will investigate the complaint and provide this information to the USFWS either recommending or denying the permit application by submitting a Form 37 (*Migratory Bird Damage Project Report*).

Snap traps with wooden bases can be effective in killing offending birds, usually woodpeckers. The trap is nailed to the building with the trigger pointed downward alongside the area of the building sustaining the damage. The trap is baited with nut meats (walnuts, almonds, or pecans) or suet. If multiple areas are being damaged, several traps can be used.

Carbon dioxide (CO_2) gas is a colorless, odorless, noncombustible gas approved by the AVMA as a euthanasia method (Beaver et al. 2001). CO_2 is a common euthanasia agent apparently because of its

ease of use, safety, and ability to euthanize many animals in a short time span. The advantages of using CO_2 are: 1) the rapid depressant, analgesic, and anesthetic effects of CO_2 are well established, 2) CO_2 is readily available and can be purchased in compressed gas cylinders, 3) CO_2 is inexpensive, nonflammable, nonexplosive, and poses minimal hazard to personnel when used with properly designed equipment, and 4) no CO_2residues accumulate in tissues. CO_2 has been used to euthanatize mice, rats, guinea pigs, chickens, and rabbits, and to render swine unconscious before humane slaughter. Studies of 1-day-old chickens have revealed that CO_2 is an effective euthanatizing agent. Inhalation of CO_2 caused little distress to the birds, suppressed nervous activity, and induced death within 5 minutes. In addition, inhalation of CO_2 at a concentration of 7.5% increases the pain threshold, and higher concentrations of CO_2 have a rapid anesthetic effect.

WS sometimes uses CO_2 to euthanize birds which have been captured in live traps, by hand, or by chemical immobilization and when relocation is not feasible. Live birds are placed in a container or chamber and CO_2 gas from a cylinder is released into the chamber. The birds quickly expire after inhaling the gas.